ANNUAL REVIEW AND FORECAST NUMBER

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Textile World

FEB. 28, 1934

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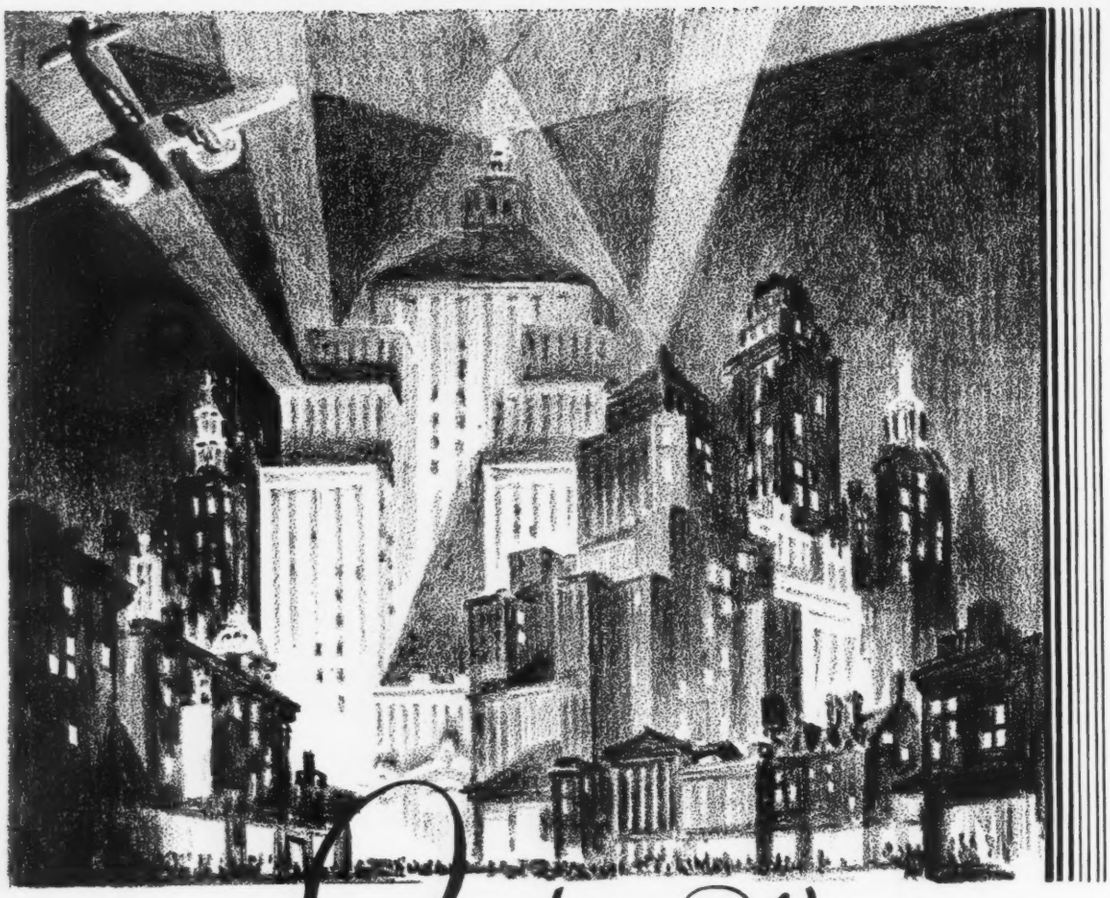

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ANNUAL REVIEW AND FORECAST NUMBER

Textile World

February 28, 1934

Editor: DOUGLAS G. WOOLF

Planning the Textile Future

FOUR years ago, in these columns, we took stock. We called the result TEXTILE WORLD'S Editorial Inventory: an itemization of the outstanding objectives of the textile industry, as we visualized them.

Periodically since then we have been checking progress made on each of these items—revising them and adding others as changing conditions necessitated.

It has been intensely gratifying to us to follow the accomplishments which the industry has realized in most of these directions. We should like to record them here. However, this is no time for history. The future beckons: a future whose full potentialities none of us can grasp as yet. The promise of its opportunities is matched only by the tragedy which threatens if those opportunities are muffed.

We offer no apologies for discussing future planning. We know it is stylish, in certain quarters, to sneer at this thought as the brainchild of academicians. But we also know those sneers, if indulged in, will prove to be expensive.

Whether we welcome or resent the fact, it is still a fact that the stage has been set for economic planning by industries, and by individuals identified with industries. It is also a fact that the gains of the last year cannot be capitalized unless this planning function is given first place in industrial thinking.

And so, once more we shall set down the major objectives for the textile industry as we see them. We shall classify them under the headings which we use in planning the contents of this publication: Management, Merchandising, Methods, Men, Machinery, Materials. However, we want to emphasize the fact that we are taking stock *for* the industry. We have no pride of authorship so far as these objectives are concerned. They are the objectives toward which leaders of textile thought themselves have been striving and are striving.

We shall limit our observations to those items which we regard as fundamental. There are many subordinate and supplementary objectives toward which the industry is working, but the enumeration of these would tend to confuse, rather than to strengthen, this inventory.

★

Management: Through its organizations, the industry has one pressing job: The perfection of plans for equitable and near-automatic adjustment of production to demand, with the least possible friction and the least possible fluctuation in employment. And that *is* a job! Any code authority will tell you that. At present, it is tied up with the NRA. But no matter what eventually happens to the NRA, this function will be an integral part of the industry's planning in the future.

For the individual, the outstanding job is the development of a type of budgetary control best fitted to his particular case—a linking of intelligent sales forecasts to stable production schedules. Some say this can't be done in textiles. It has been done. It must be done.

★

Merchandising: Here, the collective job is the perfection of fair trade practice provisions. Some branches of the industry are hard at work on these; others are lagging. This job, too, is far more than an NRA job; it represents a need which has been recognized for years.

For the individual, the merchandising task is two-fold: Development and maintenance of intelligent pricing policies, in which of course sound costing principles and methods play an important part; and adjustment of his product continually to customer-needs rather than to his equipment and organization facilities.

★

Methods: For the further development of manufacturing technique, the advancement of

organized technical research is essential. The Textile Foundation and the U. S. Institute for Textile Research have made a good start. Their progress now depends very largely upon the interest and support of associations and individuals.

What more the individual can do in this direction cannot be estimated categorically. Much depends upon the size and type of his organization. However, no matter how much or how little applied research he can or should engage in, there can be no excuse for failure to keep posted on current developments. Much good work being done by research students and others will merely gather dust on library shelves if individual manufacturers do not make it a point to expose their minds to the results.

★

Men: We have stated previously in these columns that one of the greatest jobs facing textile associations was the formulation of sound principles of employer-employee relationships. The events of recent months have dramatized this need. Above all, a defensive attitude must be discarded. There is, of course, inevitable conflict between the immediate aims of employers and those of their employees. There is, or should be, no conflict between their aims for the broad future. A sound industry is just as important for the one as for the other. So long as antagonism prevails, that aim will be obscured.

For the individual employer, the most important need is receptivity of mind. Old prejudices must be examined before they are permitted to dominate the future.

In our first Editorial Inventory, we concluded: "The greatest single need is the transformation of the industry from a low-wage to a high-wage industry." We have gone far toward that end. This progress must not be interrupted by class antagonism.

★

Machinery: Cooperatively, the industry can do most toward solving the many fundamental mechanical problems—inherent in an age-old enterprise—by supporting organized research programs.

Individually, manufacturers have as their primary job the formulation of long-term programs of modernization, by which their plant and equipment may meet the requirements which both depreciation and obsolescence entail.

★

Materials: Here, too, organized research can do much toward eliminating the guess-work which now prevails in connection with textile raw materials, finishing materials, and other commodities.

For the individual, it is just as important to keep in touch with developments in this field as in the field of machinery. Intelligent purchasing, based on sound laboratory and plant testing procedure, is the answer.

★

Practically every intelligent manufacturer and association official would agree, we believe, that the principles set down under any one of the above six classifications are sound. It is the coordination of all of them, however, which is most essential in future cooperative and individual progress.

A company cannot point with pride to the fact that it has a good cotton buyer, or that its equipment is up-to-date, or that its product is well received. Pride is justified only if all the functions pertaining to Management, Merchandising, Methods, Men, Machinery and Materials are unified in a balanced and smoothly-working organization.

Douglas G. Woolf

EIGHT-IN-ONE

Dear Reader:

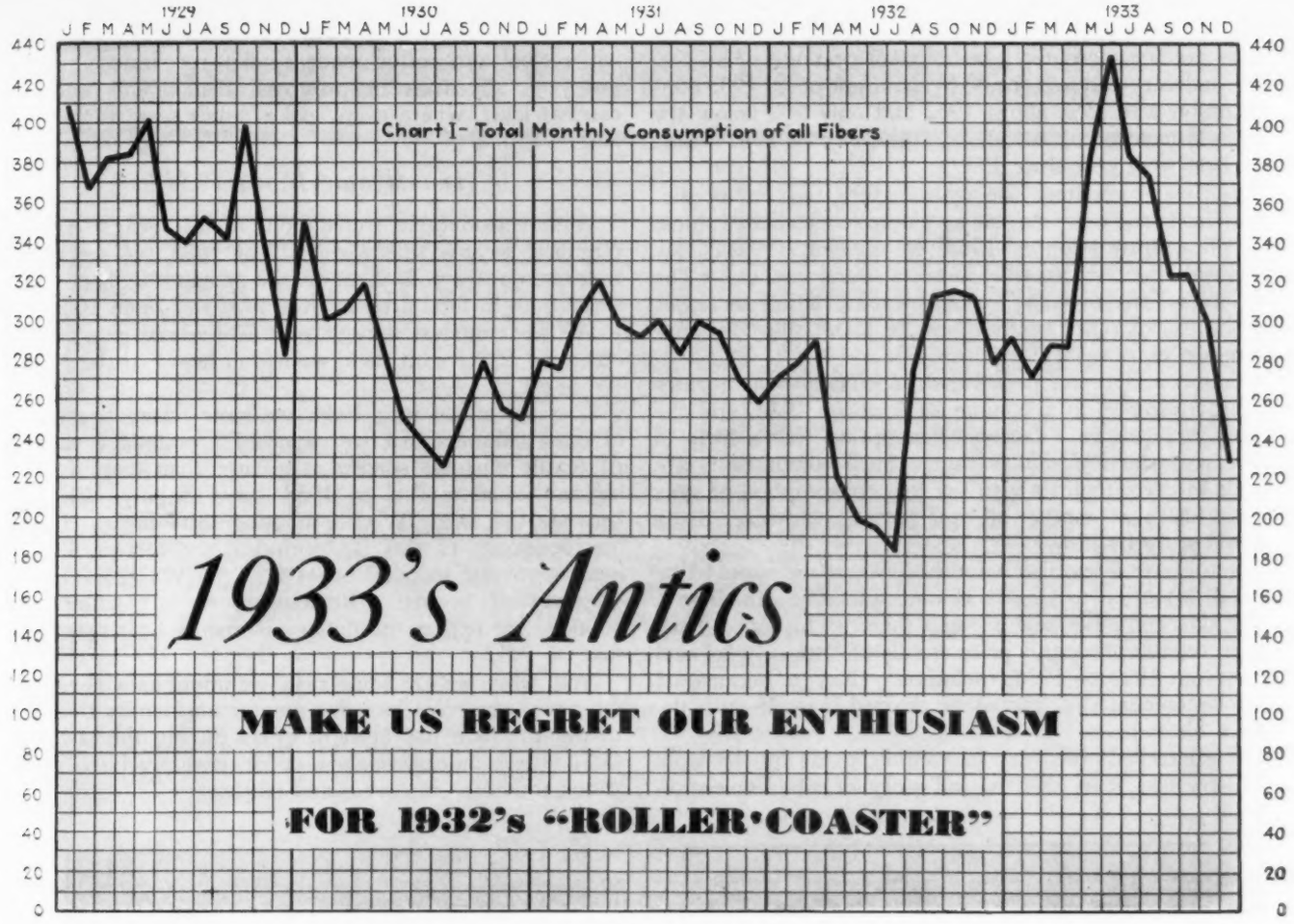
We have tried to give you your money's worth in this year's Annual Review and Forecast Number: eight magazines for the price of one. In the center, printed on distinctive paper, are six sections devoted to the six major branches of the textile industry: Cotton, Wool, Silk, Rayon, Knit Goods, Processing. Preceding those sections is this general section; following them is one devoted to Mill Engineering.

Possibly as you came in, you noticed the cover. That, dear reader, is what is known as montage photography. (We're not trying to be superior; we didn't know it ourselves until about two months ago.) You'll either like it a lot, or think it's simply awful. We like it. And it has a theme: "Planning for the Future." See if you can figure it out.

Yours for bigger and better montages,

THE EDITOR.

P. S.—In the matter of credit—the montage was prepared by Frank Ehrenford, New York photographer. We are indebted to Dixie Mercerizing Co. for the picture of the cones at upper left of cover and to Sidney Blumenthal & Co. for the picture of the weaver's hands.



WE regret having using up so many rhapsodic expressions in last year's Annual Number when we were trying to describe what we called the roller-coaster year of 1932 in textiles. We could use some of those phrases to good advantage now. For 1933 made its predecessor look like a piker. We thought we had seen the ultimate in convulsive movements—but that only goes to show how unsophisticated we were.

1933 Was 25% Over 1932

Having squandered our words last year, we must rely on a chart (Chart I) to tell the story. And we feel it performs pretty well. Tracing as it does the course of mill activity from 1929 to 1933 inclusive, it presents as its feature number the curve of 1933. The climb from April to June and the drop from June to December combine to form a movement which we can't describe adequately without using the term "cock-eyed." However, lest our more nervous readers worry too much about the end-year position as shown on the chart, we hasten to remind them that organized curtailment programs were in effect in most branches in December.

Actually, 1933 textile mill activity was 25% above 1932. It was the highest year since 1929—and only 10% below that banner year.

Once more we are impressed with the relative stability of the textile industry, in so far as mill operations are concerned. Using the 1923-25 average activity as the base (100), we get the following index numbers for the last five years:

1929	115
1930	89
1931	93
1932	83
1933	104

In other words, the high year was only 15% above, and the low year only 17% below, what economists now assume as a "normal" year.

This stability is further dramatized by the fact that the total mill activity for the last four years (1930-33 inclusive)—years of record depression—was only 17% below the total for the previous four years (1926-29 inclusive)—industrial boom years.

It becomes increasingly evident that volume is not the principal worry of the textile industry; margins are what tell the real story.

Trends by Individual Fibers

Thus far we have been talking about the industry as a whole. When we start to pick it to pieces, we encounter some striking trends. Wool and silk furnished most of the drama in 1933—the former by its good behavior, and the latter by its bad.

A year ago, after reporting that 1932 wool consump-

CHART I (above)—TREND OF GENERAL TEXTILE ACTIVITY is based on total monthly consumption of raw material, charted directly, in hundreds of thousands of pounds. Relative trends of individual fibers are shown in Chart II and relative price movements are shown in Chart III, both on next page.

tion had been 25% under 1931, we predicted: "The prospects are for a decidedly better wool year in 1933. . . . . The industry can use one." Well, it got one. 1933 consumption was 35% above 1932 and only 9% below the 1923-25 average or so-called "normal." In fact, it was the best wool year since 1929.

Silk was something else again. Here, too, our prediction was borne out. A year ago, despite excellent volume of silk consumption in 1932, we gloomed: "The raw material situation [in silk] is not a sound one. . . . . The outlook is still unstable." And, despite radical increases in the use of other textile fibers in 1933, silk consumption last year was 15% below 1932.

Cotton and rayon performed adequately—the former being consumed in a volume 24% above 1932, and the latter 36% above. Cotton consumption was a little in excess of the 1923-25 average. Such comparisons are futile in rayon; suffice it to say that consumption of synthetic fibers set another all-time record. However that's an old story by now.

Before we leave the individual fibers, we should like to call attention to Charts II and III. We ran these a year ago, and have now brought them up to date. They show consumption and price trends of cotton, wool and silk from 1923 to 1933, inclusive. [Rayon, because of its phenomenal rise, cannot be charted in scale with the other fibers.]

The excellent recovery in volume, made by the wool industry last year, and the sad story of silk's downfall, are the main features of Chart II. Chart III shows that, while wool and cotton made similar recoveries in price last year, silk made no progress at all. This was one case, at least, where a low price didn't seem to mean a large volume.

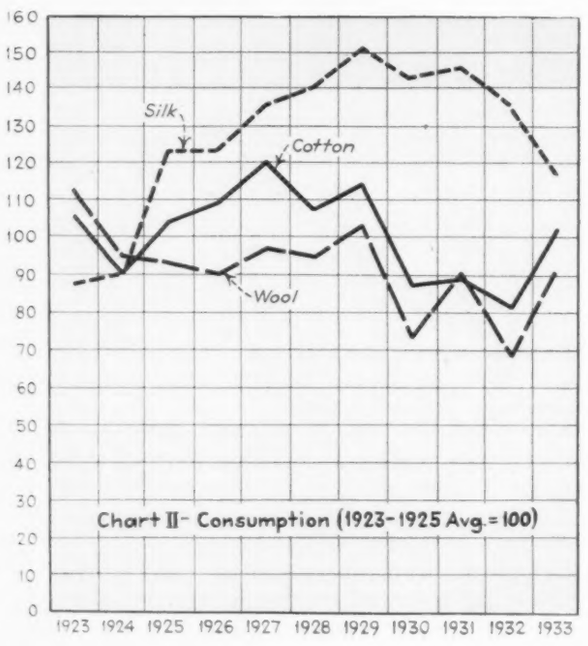
And What About 1934?

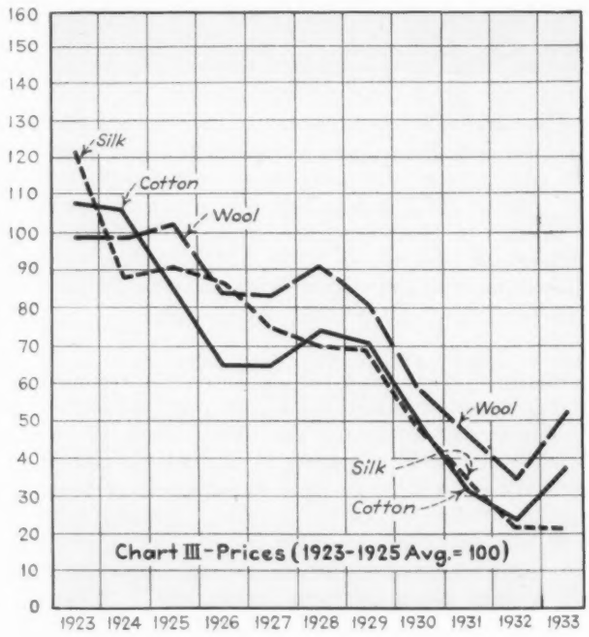
With considerable trepidation, in last year's Annual Number, we told the world: "For 1933, we see fairly well-maintained volume of textile demand, with possibly slight gain in total activity over 1932 say 7½ to 10%."

We *were* modest weren't we? The actual gain turned out to be 25%. But then, we hadn't heard of the NRA, AAA, etc.

Looking ahead into 1934, we have stated previously in these columns that we expected a poundage volume of textile business somewhat greater than that of 1932 but not equal to that of 1933—say, roughly, half-way between the two. We see nothing thus far to change our opinion. If this is approximately correct, it will mean a volume some 93 or 94% of the 1923-25 average, or so-called normal. Remember, we are talking in pounds; we expect the dollar volume to be larger than that of 1933.

And, while we are being rash, we might as well extend this prophecy. We look for greater uniformity over the 12 months than has been in effect during the last two years (that's an easy one); and for more *profitable* operations for both employers and employees.





CHARTS II AND III—ACTIVITY AND PRICE TREND SINCE 1923

Chart II, at left, and Chart III, at right, show activity and price trends, respectively, in cotton, wool and silk from 1923 to 1933, inclusive. Rayon, which enjoyed its major production rise during the period, is not included as it is out of all proportion to the three older fibers. Both charts are plotted from index numbers, with the average of the three years 1923-25 as the base, 100. In other words, the curves show, for each year, the relationship of the fiber's behavior in that year to the base period in terms of percentage. Chart II is based on yearly consumption of the fibers; Chart III on TEXTILE WORLD'S *price index numbers. [As an example of the significance of the charts, Chart II shows that in 1933 cotton and wool consumption made a concerted increase which brought them both close to the 1923-25 average, while silk, though still above the base average, continued the decline in consumption started in 1931; Chart III shows that although the relative declines in cotton and silk closely paralleled each other, cotton made a recovery while silk moved sideways in 1933.]*

THE TEXTILE CODES AT A GLANCE

	Cotton Textile	Thread	Wool Textile	Carpets and Rugs	Wool Felt	Silk Textile
Field Covered	Manufacture of cotton yarn and/or cotton woven fabrics, whether as final process or as part of a larger or further process.	Manufacture of sewing, crochet, embroidery, and/or darning cotton thread.	Manufacture of worsted men's-wear and women's-wear; carded men's-wear and women's-wear; blankets, cotton-warp fabrics, reworked wool, knitted woolen goods, worsted sales yarn, carded sales yarn, and combing, wool scouring and carbonizing.	Manufacture and original sale of all woven floor-coverings, and spinning of carded wool or worsted sales yarn for carpets and rugs. (Woven floor coverings, principal content of which is cotton, grass or paper, are specifically excluded.)	Manufacture or original sale of wool felt, defined as non-woven material composed principally of wool or wool and cotton, manufactured by hardening and fulling process.	Manufacture of silk and/or rayon and/or acetate yarn (or any combination thereof) woven fabrics or any of the processes of such manufacture except throwing, but not including such manufacture of rayon and/or acetate fabrics as are governed by cotton code.
Maximum Hours per Worker	40 hrs. per week. (Except repair crews, engineers, electricians, firemen, supervisory staff; shipping, watching and outside crews; cleaners.)	40 hrs. per week. (Exceptions as in cotton code.)	40 hrs. per week. (Except repair crews, engineers, electricians, firemen; office, sales and supervisory staff; shipping, watching and outside crews.)	40 hrs. per week, but 48 hrs. maximum permitted for six weeks during any six-months period. (Professional and managerial workers exempted; tolerance for other special groups.)	40 hrs. per week. (Except managerial employees, outside salesmen; watchmen. Tolerance provided for certain special groups.)	40 hrs. per week. (Except in emergency repair crews, electricians and engineers may have 10% tolerance; over-time above 40 to be paid time and one-third.)
Maximum Hours per Machine	Two 40-hr. shifts per week for spinning spindles and looms.	Two 40-hr. shifts for productive equipment.	Two 40-hr. shifts on combs, spinning spindles, looms, and knitting machines. (Woolen spindles and worsted combs temporarily excepted.)	No provision.	No provision.	Two 40-hr. shifts per week for productive equipment.
Minimum Wages	$12 per 40-hr. week in South; $13 in North. (Except learners during 6-weeks apprenticeship; cleaners and outside employees.)	$12 per 40-hr. week in South; $13 in North. (Exception as in cotton code.)	$13 per 40-hr. week in South; $14 in North.	$12 per 40-hr. week in South; $14 in North. Prior differentials maintained. Learners not less than 80% of minimum during 6-weeks apprenticeship.	$14 per 40-hr. week. Prior differentials maintained.	$12 per 40-hr. week in South; $13 in North. (Except learners during 6-weeks apprenticeship.) Amounts as of July 1, 1933, in higher paid classes must be maintained.
Installation of Equipment	Requires certification of installation of additional productive machinery, other than for replacement or to bring plant in balance.	Same as in cotton code.	No provision.	No provision.	No provision.	No provision.
Fair Trade Practices	Code Authority setting up by groups, requirements as to methods of trading, naming and reporting of prices—to prevent unfair competitive prices and practices.	Merchandising plan and code of ethics developed.	Provision made for supplementary clauses to be submitted from time to time to NRA. Several groups have submitted same.	Detailed provisions governing control of production, selling below cost, open price data, rebates, donations, contracts, quality specifications, copying of patterns, terms, allowances, etc., etc.	Prohibits misleading advertising, commercial bribery, inaccurate quotations and invoices, special privileges to customers, repudiation of contract.	Provides for equal terms and prices; prohibits selling below cost; requires payment at invoice rate within 10 days; checks style piracy; sets up standard terms.
"Stretch-out"	Status quo, as of July 1, 1933, maintained.	Same as in cotton code.	Status quo, as of July 1, 1933, maintained.	No provision.	Status quo, as of July 1, 1933, maintained.	No provision.
Organization Submitting Code	Cotton Textile Industry Committee, 320 Broadway, New York.	Thread Institute, 11 West 42nd St., New York.	National Association of Wool Manufacturers, 229 4th Ave., New York.	Institute of Carpet Manufacturers of America, Inc., 405 Lexington Ave., New York.	United States Felt Manufacturers Institute, 315 4th Ave., New York.	Silk Association of America, 468 4th Ave., New York.
Status	Approved by President and became effective July 17.	Approved by President as modification of cotton code and became effective Nov. 13.	Approved by President and became effective Aug. 14.	Approved by President and became effective Jan. 13.	Approved by President and became effective Dec. 11.	Approved by President and became effective Oct. 16.

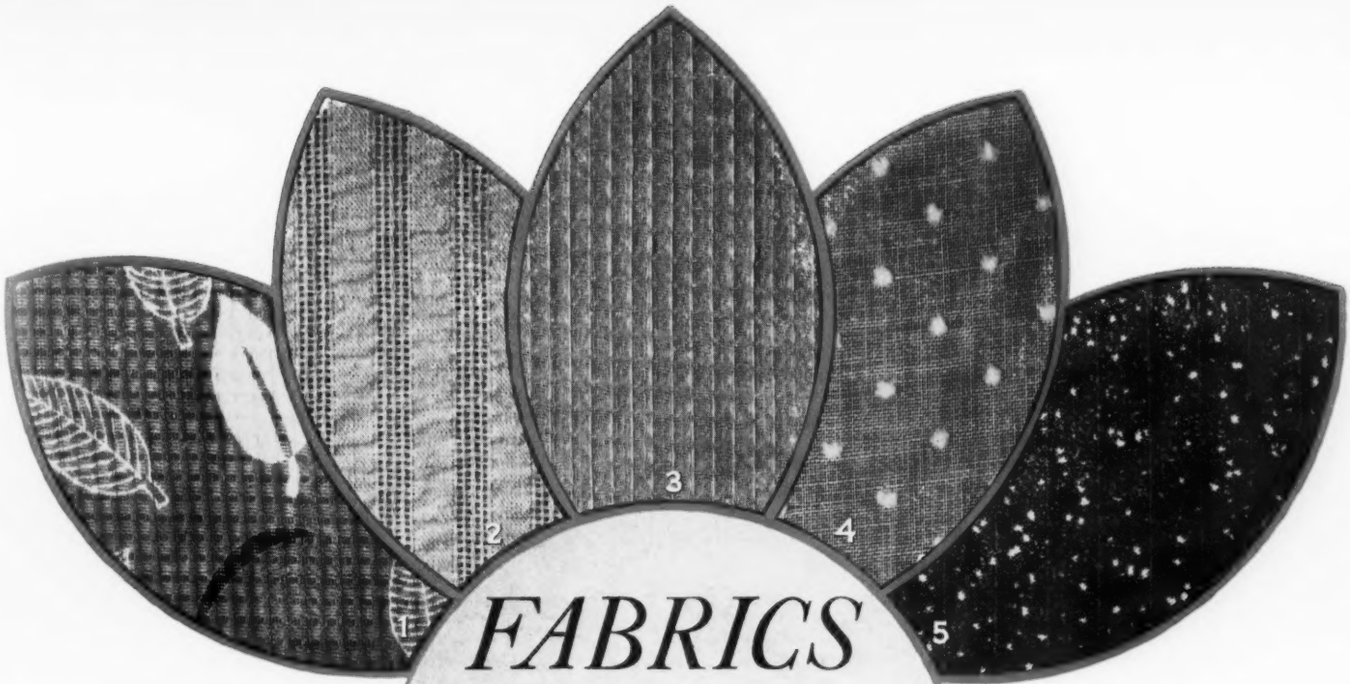
	Velvet	Throwing	Rayon Weaving	Rayon Yarn	Hosiery	Underwear
Field Covered	Production and distribution of velvet by employers operating velvet looms, excluding such processes as are covered by rayon and silk dyeing and printing code.	All plants of throwing machinery whether owned and/or operated by commission throwsters or by those throwing material for sale or for their own use and made of silk, rayon, or acetate yarns.	Manufacture of woven rayon fabrics, 18 in. or more in width, the warp of which is primarily rayon or other synthetic fiber yarn, whether finished or unfinished.	Manufacture of rayon and/or synthetic yarns from cellulose put up and packaged in forms suitable for various consuming and fabricating branches of textile industry. (Two largest acetate producers applied for own supervising agency; matter still pending.)	Manufacturing, finishing, repairing, and selling by manufacturers, or distributing by wholesalers and selling agents, of hosiery.	Knitted, woven and other underwear, and garments made in underwear mills (with certain exceptions); fabrics sold for underwear made on flat or warp or circular knitting machines; knitted elastic fabrics, tubing for meat bagging, work-glove fabrics, fabrics for leggings, and wash cloths.
Maximum Hours per Worker	40 hrs. per week. (Except employees earning $35 per week in certain capacities; watchmen, office employees, and employees on emergency repair work.)	40 hrs. per week. (Except in certain maintenance groups, where 44-hr. week is permitted when necessary.)	40 hrs. per week. (Exceptions as in cotton code.)	40 hrs. per week—based on 4 weeks average. (Maintenance and repair crews may have extension in an emergency.)	40 hrs. per week. (Except supervisors, foremen, engineers, electricians, repair men, dyers, shipping crews, watchmen, cleaners, outside crews.)	40 hrs. per week. (Except 10% tolerance for repair crews, machine fixers, engineers, electricians, watching crews.)
Maximum Hours per Machine	Two 40-hr. shifts per week for productive equipment.	Two 40-hr. shifts (except skeleton shift not over 35% of larger regular shift may work when neither of two full shifts is working but at higher minimum wage.)	Two 40-hr. shifts for looms.	No limitation; continuous operation permitted.	Two 40-hr. shifts. Full-fashioned footing equipment may be operated one-shift, 40-hr. maximum, or two-shifts, 36-hr. maximum per shift.)	One 40-hr. shift for sewing machines; two 40-hr. shifts for knitting machines.
Minimum Wages	$13 per 40-hr. week. (Except learners during 6-weeks apprenticeship.) Differentials existing prior to June 26, 1933, to be maintained.	$12 per 40-hr. week in South; $13 in North. (Except bobbin and skein carriers, and bobbin cleaners; specifications set for learners.)	$12 per 40-hr. week in South; $13 in North. (Exception as in cotton code.)	$13 per 40-hr. week. (Employees may not receive less for 40 hrs. than for 48-hr. week as of May 1.)	Sliding scale, with lowest minimum $12 per 40-hr. week in South and $13 in North. (Except learners, for 3 months, minimum $8; and sub-standard workers.)	$12 per 40-hr. week in South; $13 in North. (Except learners, no less than $8; and cleaners, outside workers and privileged employees no less than 75% of regular minima.)
Installation of Equipment	Code authority may require certification of installation of additional productive machinery, other than for replacement of looms by looms of same width.	Code authority may require certification of purchase or building of throwing machinery; or establishment of throwing plants.	Same as in cotton code.	No provision.	Code authority may require certification of installation of additional productive equipment, except for replacement or to bring plant in balance.	Merely provides that all persons engaged in engaging in industry shall register with Code Authority each unit of their productive machinery.
Fair Trade Practices	Provides for equal terms, etc., to buyers similarly situated; prohibits commercial bribery; sets maximum selling terms; prohibits design piracy.	Prohibits sale below cost, commercial bribery, and secret payment of refunds or rebates. Provides open-price plan, subject to further study by NRA.	Same as in cotton code.	No provision.	Detailed trade practice provisions include prohibition of selling below cost; specifications to prevent misbranding; etc., etc.	Prohibits selling below cost; sets standard terms; prohibits various types of abuses and misrepresentation; provides for filing price lists.
"Sweatshops"	No provision.	No provision.	Same as in cotton code.	No provision.	Status quo, as of July 15, 1933, maintained.	Status quo, as of July 1, 1933, maintained.
Organization Submitting Code	Velvet Manufacturers Association, 110 W. 39th St., New York.	Throwsters Research Institute, 468 4th Ave., New York.	National Rayon Weavers Association, 40 Worth St., New York.	Rayon and Synthetic Yarn Industry Committee, 2 Park Ave., New York.	National Assn. of Hosiery Mfrs., 468 4th Ave., New York.	Underwear Institute, Union Trust Bldg., Washington, D. C.
Status	Approved by President and became effective Jan. 8.	Approved by President and became effective Oct. 16.	Approved by President Aug. 25 by modifying and amending cotton textile code.	Approved by President and became effective Sept. 9.	Approved by President and became effective Sept. 4.	Approved by President and became effective Oct. 2.

AT A GLANCE (Continued)

Knitted Outerwear	*Knit Gloves*	*Cotton and Rayon Finishing*	*Mercerizing*	*Rayon & Silk Dyeing & Printing*	*Textile Processing*
Manufacture of knitted outerwear apparel and/or knitted fabrics for outerwear—but shall not include products of hosiery and/or underwear industries and/or manufacture of knitted woolen goods in woolen mills—nor manufacture of garments made of purchased knitted fabrics.	Manufacture of woolen knit gloves. (Included in code for Leather and Woolen Knit Glove Industry.)	Finishing of fabrics whether woven of cotton or rayon or other synthetic fiber, or of mixture, provided finishing is done by concerns engaged in weaving cotton and/or rayon, or engaged solely in finishing cotton woven fabrics, or primarily engaged in finishing cotton fabrics, but also do rayon.	Cotton yarn mercerizing.	Dyeing, finishing, bleaching, mercerizing, weighting, printing of rayon, silk, or mixtures in piece or in yarn—but not including concerns engaged in weaving cotton and/or rayon covered in cotton code; and not including nonmember concerns engaged in processing rayon yarn.	Commission processing of raw stock, tops, yarns, knitted textile fabrics, hosiery, woolen and/or worsted woven fabrics; commission mercerizing and glazing of cotton yarns; commission winding, warping, slashing, and/or beaming of yarns; etc., etc.
40 hrs. per week. (Except repair crews, engineers, electricians, firemen, supervisors, shipping, watching and outside crews, cleaners, and office employees.)	40 hrs. per week (but Authority may fix periods during peak seasons when week may be extended to 44 hrs.)	40 hrs. per week. (Exceptions as in cotton code, plus proviso employees on continuous chemical processes may work up to 48 hrs.)	40 hrs. per week. (Exceptions as in cotton and rayon finishing.)	40-hr. per week. (Except engineers, electricians, firemen, maintenance and transportation crews, and watchmen.)	40-hrs. per week, with leeway for exigencies. (Except supervisory, laboratory and office employees, repair crews, engineers, electricians, shipping crews, firemen and watchmen.)
Two 40-hr. shifts for productive machinery; one 40-hr. shift for all other machinery. (Except employer may operate all on one shift, with leeway to 48 hrs. for two four-weeks periods a year.)	No provision.	Two 40-hr. shifts per week for productive machinery. (Except mill finishers may operate long enough to finish their own fabrics.)	Two 40-hr. shifts for cone winding machines, reels, through tube cop machines and parallel tube winding machines used in mercerized yarn production only.	80 hrs. per week for productive machinery; 96 hrs. for plant. (Except velvet processing, in seasonal peak.)	Winding machines and certain other equipment used in mercerized yarn production only are limited as in cotton code.
$13 per 40-hr. week in South; $14 in North. (Except learners and substandard employees.) Prior differentials maintained.	$13 per 40-hr. week. (Except beginners and apprentices.) Prior differentials maintained.	$13 per 40-hr. week in South; $14 in North.	$12 per 40-hr. week in South; $13 in North.	$18 per 40-hr. week for males; $14 for females.	$13 per 40-hr. week for cotton and rayon yarn processing; $14 for all other processing. (Minimum wage in South may be lower but not to exceed 2½c per hr.)
No provision.	No provision.	Same as in cotton code.	Same as in cotton code.	Requires certification of installation of additional equipment, except for replacement purposes, and except for velvet processing machinery.	No provision.
Bans selling below cost; restricts consignment selling; bans misbranding and misrepresentation; specifies terms, and policy on returns, rebates, etc. Restricts home work.	Detailed provisions cover bribery, false invoicing, design piracy, consignment, selling below cost, returns, misleading advertising, etc. Home work restricted.	Same as in cotton code.	Same as in cotton code.	Bans selling below cost; provides for uniform contract, etc. Also for subsequent Code of Ethics.	Left for subsequent action.
No provision.	No provision.	Same as in cotton code.	Same as in cotton code.	No provision.	No provision.
National Knitted Outerwear Association, 1 Madison Ave., New York.	National Association of Leather Glove Manufacturers, Inc., Gloversville, N. Y.	National Association of Finishers of Textile Fabrics, 40 Worth St., New York.	Mercerizers Association of America, 1412 G St., N.W., Washington, D. C.	Institute of Dyers and Printers, Inc., Paterson, N. J.	National Textile Processors Guild, Inc., 45 E. 17th St., New York.
Approved by President and became effective Jan. 1.	Approved by President and became effective Nov. 13.	Approved by President as modification of cotton code and became effective Nov. 13.	Approved by President as modification of cotton code and became effective Nov. 13.	Approved by President and became effective Dec. 21.	Approved by President and became effective Feb. 5.

TEXTILE CODES AT A GLANCE (Cont'd)

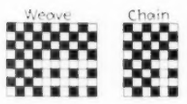
	Textile Machinery	Knitting & Braiding Machinery	Lace	Nottingham Lace Curtains	Upholstery and Drapery Fabrics	Hair and Jute Felt
Field Covered	Manufacture for sale of complete machines and parts and accessories used in textile mills for manufacture of yarn and/or woven fabrics or for finishing or dyeing.	Manufacture of knitting and braiding machines, and parts. (Code also includes wire-covering machines.)	Manufacture of products of Levers, Go through, Bobbinet, Barmen or Mechlin machines and/or any and all processing thereof.	Manufacture of all articles, goods, and fabrics made in whole or in part of animal, vegetable, or mineral matter made on the Nottingham lace curtain machine.	Includes, without limitation as to materials used, manufacture of upholstery and drapery woven pile fabrics and upholstery and drapery fabric without pile made on 4 x 4 box broad looms, with design requiring jacquard machine having 600 hooks or more, requiring two shuttles or more.	Manufacture of felt principally from hair and/or jute by the hardening and/or punching processes.
Maximum Hours per Worker	40 hrs. per week. (Except, in peak periods, may work 48 hrs. per week in 8 weeks of any six months' period, but total for the six months must average not more than 40 per week.)	40-hrs. per week (with same exception as in Textile Machinery Code).	40 hrs. per week. (Except repair crews, salesmen, supervisory staff. Also except engineers, electricians, firemen, designers, draftsmen and shipping crews, but time-and-one-half for overtime.)	40 hrs. per week. (Except repair crews, engineers, electricians, firemen, office, supervisory staff, and shipping, watching and outside crews.)	40 hrs. per week. (Except tolerances for certain groups.)	40 hrs. per week. (Except 10% additional allowance to repair crews, firemen, engineers, electricians, etc., at time-and-one-third for over 40 hrs.)
Maximum Hours per Machine	No provision.	No provision.	Two 40-hr. shifts for productive machinery.	Two 40-hr. shifts for productive machinery.	Two 40-hr. shifts for looms.	No provision.
Minimum Wages	Accounting, clerical and office employees, $14 per week; all other (except outside helpers and shippers South of Potomac) 35c per hr.	Accounting, clerical and office employees, $14 per week; all other (except learners and apprentices) 40c. per hr.	$13 per 40-hr. week. (Except learners, who shall be paid not less than 80% of minimum.)	$13 per 40-hr. week. (Except learners who shall not be paid less than 80% of minimum.	$12 per 40-hr. week in South; $13 in North. (Except cleaners, learners, and outside crews.)	$14 per 40-hr. week.
Installation of Equipment	No provision.	No provision.	Code authority requires certification of installation of additional productive machinery, except for replacement or maintenance of existing equipment.	No provision.	No provision.	No provision.
Fair Trade Practices	Prohibits sale below cost, and secret rebates; sets up terms for both cash and deferred payments, etc.	Prohibits sale below cost, discrimination between purchases, secret rebates, accepting old machines as part payment. Sets up terms of sale.	Bans below-cost selling; fixes terms; demands adherence to list prices; bans misrepresentation; provides for minimum standards of quality.	Sets up definite practices on deliveries, terms, advertising, piracy, rebates, etc., prohibits sales below cost.	Clauses cover terms and discounts; gratuities, selling on consignment, returns, samples, style piracy, sale below cost.	Prohibits sale below cost, nonstandard grades, false branding, secret rebates, etc., sets up merchandising standards.
"Stretch-out"	No provision.	No provision.	No provision.	Status quo, as of July 1, 1933, maintained	Status quo, as of July 1, 1933, maintained.	No provision.
Organization Submitting Code	National Association of Textile Machinery Manufacturers, 38 Chauncy St., Boston, Mass.	Knitting Machine Manufacturers Assn., c/o H. Brinton Co., Philadelphia, and Braiding & Wire Covering Machine Assn., c/o Fidelity Machine Co., Philadelphia.	American Lace Mfrs. Assn., 106 W. 38th St., New York.	National Association of Lace Curtain Manufacturers, 7 E. 44th St., New York.	National Upholstery & Drapery Textile Assn., 185 Madison Ave., New York.	Hair and Jute Felt Maunfacturers Assn.
Status	Approved by President and became effective Oct. 16.	Approved by President and became effective Oct. 13.	Approved by President and became effective Aug. 28.	Approved by President and became effective Nov. 13.	Approved by President and became effective Dec. 11.	Approved by President and became effective Nov. 14.

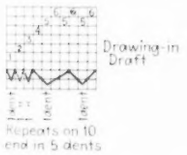


FABRICS of 1934

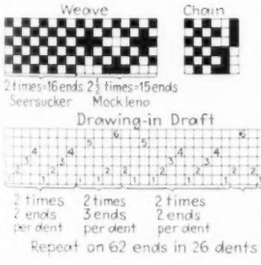
A SELECTION FROM THE MORE PROMISING COTTON, WOOL, RAYON, AND SILK SAMPLES

Constructions

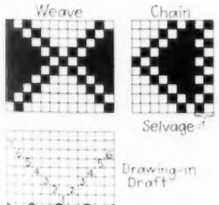




1. *Cotton Checked Voile.* Will be popular for party dresses this spring in both printed and plain colors. 36", 96x72, 50s medium-twist voile in both warp and filling.


Weave
Chain
2 times-16 ends Seersucker
2½ times-15 ends Mock leno
Drawing-in Draft
2 times 2 ends per dent
2 times 3 ends per dent
2 times 2 ends per dent
2 times 3 ends per dent
Repeat on 62 ends in 26 dents

2. *Cotton Seersucker and Mock Leno.* Promises well for dresses in plain colors, colored stripes, or prints. 37", 72x72/74x72 ave., 20s warp for seersucker, 30s warp for mock leno, and 40s filling.



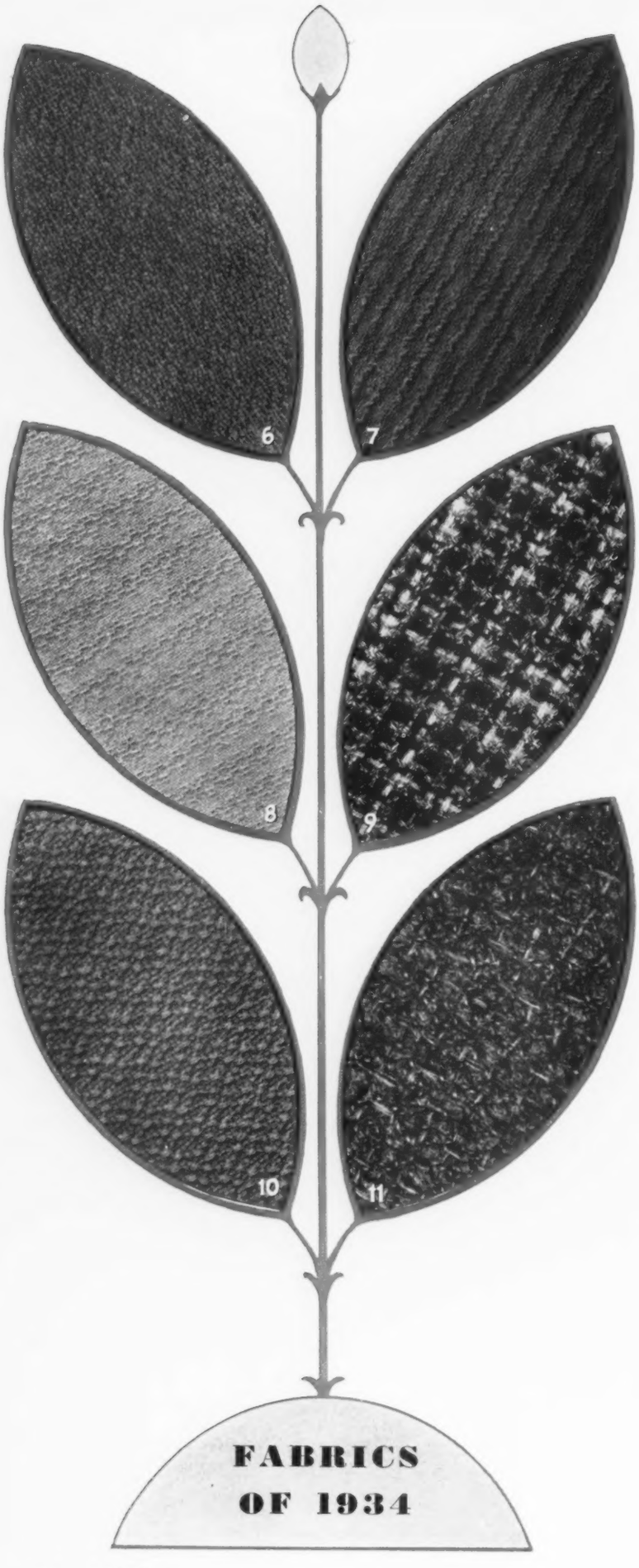
3. *All-Cotton Honeycomb.* Likely to be well received for sportwear. 37", 104x72, 3.80 weight, 30s warp, 40s filling. Set 39.40" wide, 3 ends per dent, reed having 32½ dents per in. for 37" gray width.

(Continued on next page)

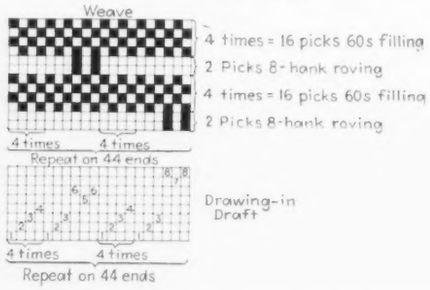
THERE are those who believe that artificial changes in style, which make or break companies and disrupt the stability of employment, should be restricted, if not eliminated—and that our already rather harassed government should even control the purchasing choice of his or her majesty, the consumer—all in order to keep industry on an even keel. What a change such restrictions would make in the textile industry! And it might be something of a relief to certain unfortunate mortals who find it necessary to forecast the styles of a future season.

In attempting to make such a forecast one does to a certain extent take one's life in one's hand; and yet there are certain channel-markers which may be followed with at least some degree of confidence. For example, B. D. Blackman, in prophesying that printed sand crepe will be the volume rayon number for this spring and summer, bases his opinion on the following four factors: (1) Prints are staple for summer wear. (2) A fabric, in order to find a place in the volume dress field, must be built to meet a popular price. (3) The converter has been on the lookout for an attractive ground weave which will offer some relief from the usual flat background of the past. (4) A fabric which meets with approval in its first year out stands a good chance in the following seasons. Putting these ingredients together and shaking them up well, Mr. Blackman derives—printed sand crepe.

We have had considerable help in selecting the samples and constructions contained in this survey, and we wish to acknowledge with gratitude the advice, samples, and constructions supplied by the following: Nos. 6 to 11, inclusive, R. A. C. Scott, Gemson-Morse Co., Inc.; 12, B. D. Blackman, Haas Bros. Fabrics Corp.; 13 and 14, C. C. Mattmann, Jr., A. M. Tenney Associates and Fitchburg Yarn Co.; 15, 16*A*, 17 and 18*B*, John Picone, Superior Fabrics, Inc.; 16*B* and 18*A*, H. E. Wenrich; 19 to 21, W. H. Six, American Bemberg Corp.; 22 to 26, C. F. Smith, Drexel Knitting Mills Co.



4. *Cotton Dotted Swiss.* For spring in over-prints or solid colors. 36″, 70x54/70x61 ave., 60s combed warp and filling, 8-hank roving for clips. Set 38.75″, 2 ends per dent in reed for 36″ gray width.



5. *Cotton Corded Pongee.* Many house dresses will be made of this fabric in printed all-over patterns. 37″, 64x84, 5s single for cords, 40s warp, 35s filling. Woven on cam loom.

6. *Worsted-Crepe Dress Fabric.* 16 reed, 2 ends in dent, 65″ wide, 36 picks, finished 6 to 6½ oz. and 54″ wide. Warp and filling yarns: *A*, 1/40s worsted right ordinary twist twisted with 1/40s worsted left ordinary twist, 2 ply twisted left; *B*, 1/40s worsted right crepe twist twisted with 1/40s worsted left ordinary twist, 2 ply twisted right.

Warp pattern:

A —	1		1	2	=	4
B —		2	1	1	=	4
						8

Filling pattern:

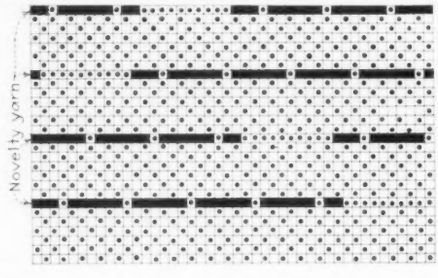
A —	1	
B —		1

Plain weave. Usual worsted finish and piece-dyed. The very subdued, yet effective, stripe is produced by the warp pattern and the reverse direction of twist accentuated by the spiral appearance and extra shrinkage of *B* twist during finishing.

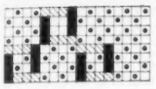
7. *Worsted Dress Fabric with Novelty Yarn.* 20 reed, 2 ends in dent, 64″ wide, 56 picks, finished 7 oz. and 54″ wide. Warp: 2 ends of 1/40s worsted crepe right twist and 2 ends of 1/40s worsted crepe left twist. Filling:

1/40s worsted crepe right	2	2	2		=	6
1/40s worsted crepe left	2		2	2	=	6
Novelty yarn (R.C. 5s)		1		1	=	2
						14

The novelty yarn consists primarily of a core yarn of 2 threads of single 40s worsted and a ratiné yarn of 2 threads of single 40s worsted. These 2 yarns are twisted right on a double-roll twister with a delivery ratio of 1.75: 1—i.e., 1¾ yd. of one yarn to 1 yd. of the other. There is also a binder thread of single 40s worsted left twist. The resultant count is approximately 5s worsted. Usual worsted finish and piece-dyed. With reference to the design, 28 bars will reduce by drafting to 20 harnesses.



8. *Worsted Suiting.* 14½ reed, 4 ends in dent, 68″ wide, 62 picks, finished 8 to 9 oz. and 54″ wide. Warp: 2 ends 1/30s worsted crepe right and 2 ends 1/30s worsted crepe left. Filling: Same as warp. Given usual worsted finish and piece-dyed. A very novel and attractive leno-stripe effect. In the accompany-



ing weave, the dark shading represents warp floats; and the light shading filling floats. 8 bars, 16 harnesses, straight draft.

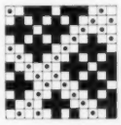
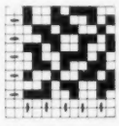
9. *Worsted Sport Suiting.* 12 reed, 2 ends in dent, 65″ wide, 28 picks, finished 8½ to 9½ oz. and 54″ wide. Warp and filling: *A*, 2/40s worsted (2 as 1) tan and white twist; *B*, 1/20s worsted (2 as 1) white; and *C*, 1/20s worsted (2 as 1) dark brown.

Warp and filling pattern:

A	—	2		2	2	2		2		2	2		2	2	2			=	20
B	—		1				1		1			1				1		=	5
C	—		2	3	3		2		2	3		2	3	3		2		=	25
																			50

The fact that both warp and filling threads are dressed and picked 2 threads as 1 enhances the appearance of the cloth and softens the handle or feel considerably. The 50 threads in pattern and the 8-harness weave give irregular effect in fabric. Given usual worsted scoured finish.

10. *Worsted Dressy Cloaking.* 14 reed, 2 ends in dent, 65″ wide, 30 picks, finished 10 to 10½ oz. and 56″ wide. Warp and filling: 2/40s left, worsted solid, dressed and picked 2 threads as 1. Novel crepe appearance is afforded by weave. Black squares in diagram correspond to pattern in fabric. Given usual worsted finish and piece-dyed.

9 10  11 

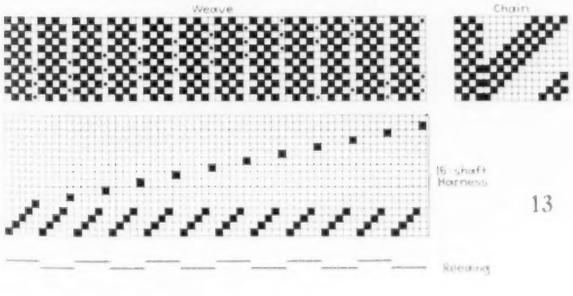
11. *Woolen Fancy Cloaking.* 8 reed, 2 ends in dent, 70″ wide, 18 picks, finished 13 oz. and 56″ wide. Warp and filling:

4 run, 2-ply, black and white	1	1	=	2
4-run white }				
4-run black } as 1 thread		1	=	1
4-run white }				
Novelty yarn (R.C. 1¼-run)			1 =	1
				4

Novelty yarn consists of core of 1/20s black cotton, a ratiné of 4-run medium gray woolen with 100% take-up, and a binder of 2/40s black cotton. The twisting is similar to that described in connection with Sample No. 7. Marks beside weave indicate black and white twist. The style, although sporty, is conservatively so; and if colors are combined judiciously, distinctive and beautiful effects can be produced. Pieces are scoured and slightly fulled.

12. *Rayon Sand Crepe, Printed.* When the spring and summer of 1934 have passed into history, reports B. D. Blackman, it will be found that printed sand crepe was the volume fabric for those seasons. Warp: 120 ends of 100-denier, 40-filament, 50/55-turn bright viscose rayon, set 45″ in reed, 40/3/1. Filling: 64 picks of 100-denier, 40-filament delustered viscose rayon with no twist. "This construction will of course be cheapened," Mr. Blackman adds. "'Sands for print' will be laid but 44″ in the reed, woven with 60 picks, and used as the dumping ground for inferiors or those lowest grades of rayon which the rayon producers will not guarantee." The weave, entering, and chain are the same as those numbered *A* and *A1* in Mr. Blackman's informative article on sand crepe, TEXTILE WORLD, December, 1932, page 69.

(Weave design below for fabric 13, which is described on next page)



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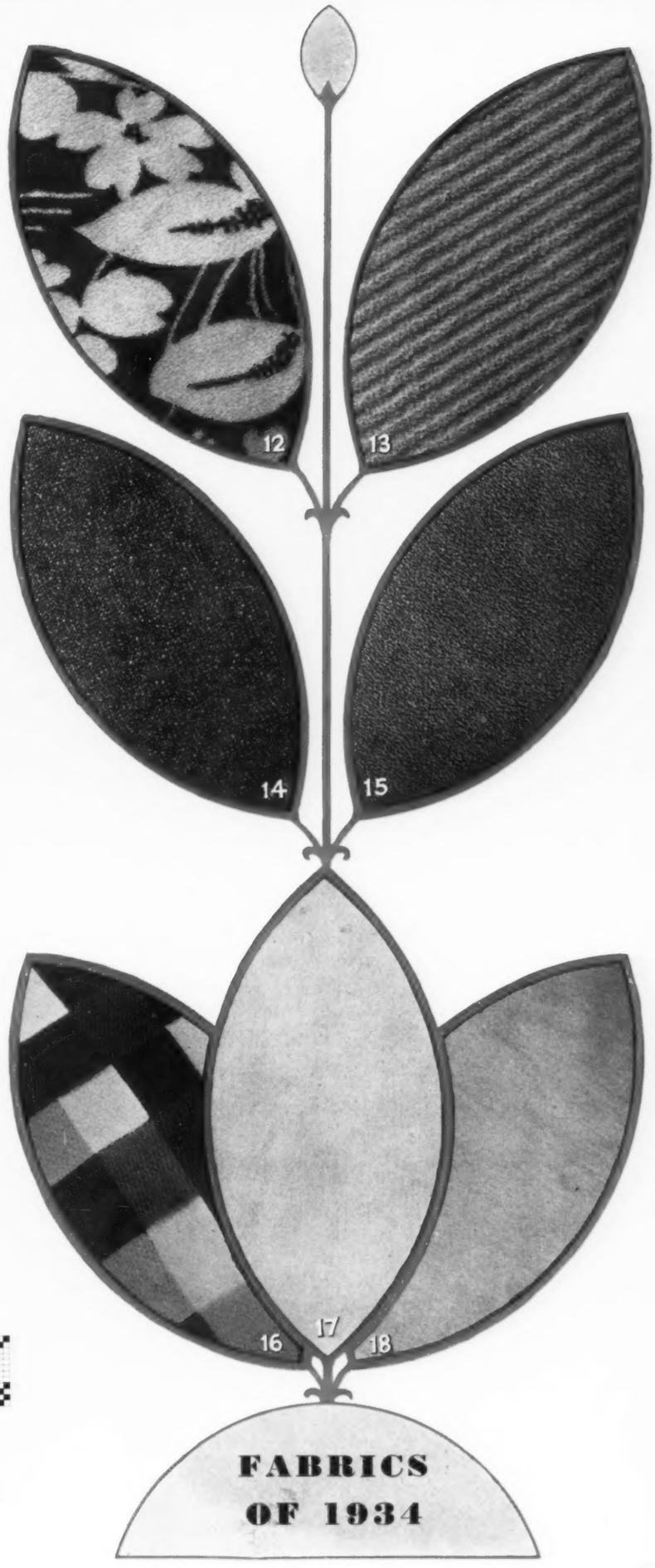

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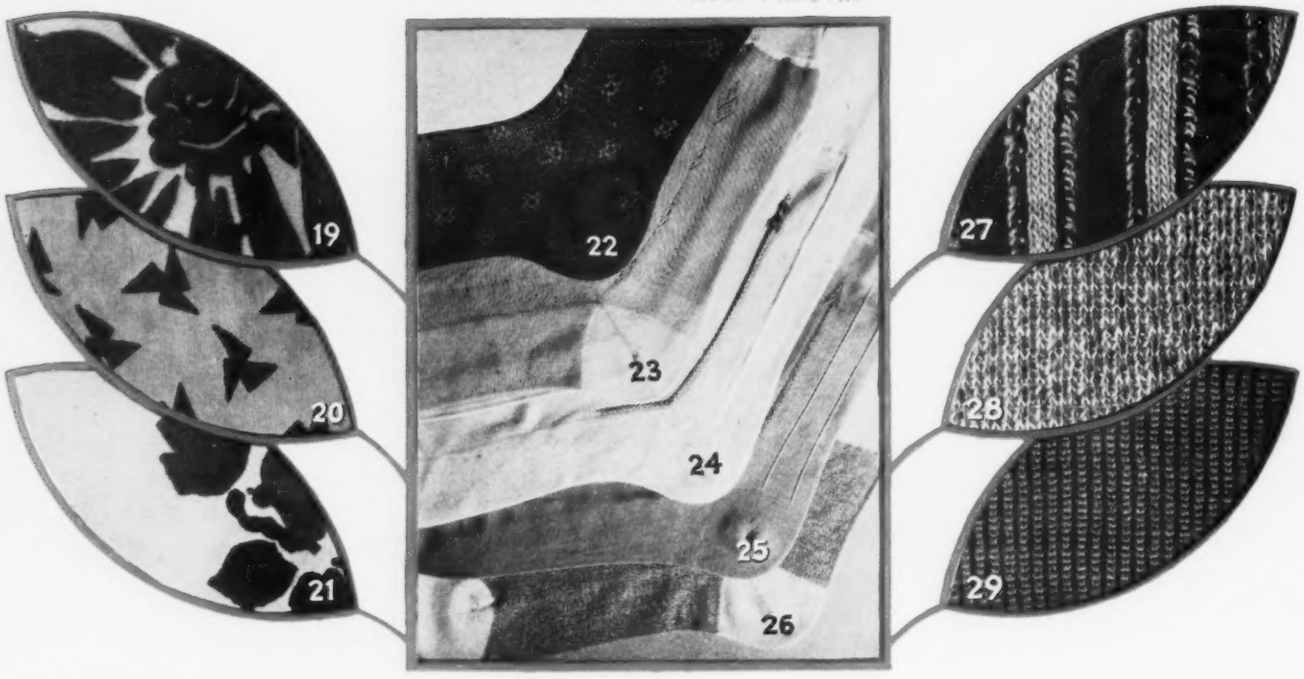
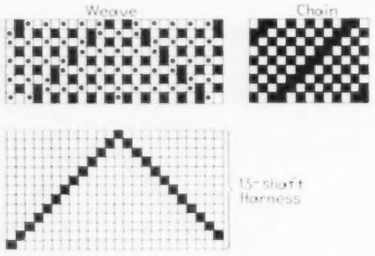


13. *Acetate and Rayon Fancy Rib-Diagonal Etamine.* Dress weight. Warp: 2-beam job, one beam containing 75/26-denier dull acetate and one containing 100/40-denier rayon crepe, left twist only; 128 ends per inch of acetate, 32 of rayon crepe, totalling 160; set 48″ reed to finish 39″; reed, 32/5/1. Filling: 60 picks of 100/40-denier rayon crepe, 50/55 turns, 2 right and 2 left. In accompanying weave diagram, black squares represent acetate; and dots, rayon crepe.

14. *Spun-Rayon and Acetate Fancy Etamine.* Dress and suit weight. Warp: 2-beam job, one beam containing 41/2 spun-rayon crepe, 1 right and 1 left, and the other containing a spiral consisting of 1 end of 35/1 spun rayon and 1 end of 75/26-denier acetate; 30 ends per inch of spun rayon, 30 of spiral, totalling 60; set 46″ in reed to finish 39″; reed, 30/2/1. Filling: 54 picks, woven pick and pick in the rotation of 1 pick of 41/2 spun-rayon crepe right twist, 1 pick of 35/1 spiral same as in warp, 1 pick of 41/2 spun-rayon crepe left twist, and 1 pick of 35/1 spiral same as in warp. In accompanying weave diagram dots represent spun-rayon crepe; and black squares, the spiral.



15. *Acetate and Rayon Moss Crepe.* Warp: 2,740 ends set 49½″ in reed, 56 ends per inch, 28 dents per inch, of combination yarn consisting of 150-denier 3-turn acetate right twist spiraled with 10 turns right around 100-denier 50-turn rayon crepe right twist, and another combination yarn consisting of 150-denier 3-turn acetate left twist spiraled with 10 turns left around 100-denier 50-turn rayon crepe left twist. Entered 1 right-twist combination yarn on first shaft, 1 left twist on second shaft, 1 left twist on third shaft, and 1 right twist on fourth shaft. Reeded 1 right twist and 1 left twist in first split, 1 left twist and 1 right twist in second split. Filling: 52 picks of same yarn as warp, 2 right and 2 left. Edge: 40/2 100-denier rayon crepe, r. and l. twist, anchor bobbins, 4/2 in dent.

16. *Silk 50/64s Print.* (Construction *A.*) Warp: 12,800 ends of 20/22 Japan, set 43″ in reed, 50/3/2. Filling: 64 picks of 3-thread 13/15 Japan, 60/65 turns, 2 right and 2 left. Edge: 36 ends reeded 3/4. Weave: 6 shafts. (Construction *B.*) Warp: 12,750 ends of 20/22 Japan set 42½″ in reed, reeded 3/2. Filling: 64 picks of 2-thread 20/22 Japan 60/65 turns; 3-thread 13/15 Japan, 60/65 turns; or 3-thread 14/16 canton, 2 right and 2 left. This fabric, Mr. Wenrich remarks, offers "a beautiful garment of real silk at an attractive price. When prints are in, the 50/64s holds sway."

17. *Silk 55/72, Lead-Weighted.* Warp: 14,300/1 (or 7150/2) ends, of which 14,156/1 are ground, set 43″ in reed, 55/3/2. Filling: 72 picks of 2-thread 20/22 or 3-thread 13/15. Edge: 36/2/3. 144 ends.

18. *Silk French Crepe or 70/76.* (Construction *A.*) Warp: 11,536 ends of 20/22 set 41″ in reed, including selvages. Reed, 70/2/2. Filling: 76 picks of 2-thread 20/22 or 3-thread 13/15, 40/45 turns, 2 right and 2 left. Slips of this beautiful, but low-cost material have lately been retailing at $1. (Construction *B.*) Warp: 11,400/1 or 5700/2 ends set 41″ in reed, 70/2/2. Edge: 12/2/2, 48 ends. Filling: 76 picks of 2-thread 20/22, 40/45 turns. Weave: 4- or 6-shaft, preferably 6.

19. *Cuprammonium Triple Sheer.* Construction in loom, 100x72. Reed, 50/2/1. Reed width, 47″ to finish 39″. Warp: 75-denier cuprammonium crepe, 60/65 turns, 2 right and 2 left. Filling: 75-denier cuprammonium, no twist.

20. *Cuprammonium Matisa Taffeta.* Construction in loom, 100x72. Reed, 50/2/1. Reed width, 43″. Warp: 100-denier cuprammonium Matisa, 5 turns. Filling: 100-denier cuprammonium Matisa, no twist.

21. *Cuprammonium Foulard.* Construction in loom, 100x72. Reed, 50/2/1. Reed width, 43″. Warp: 100-denier, cuprammonium Matisa, 5 turns. Filling: Same yarn as warp.

22. *Half Hose.* Rayon over acetate in coarse gage and with single sole for spring and summer. Colors will be mostly dark, although some will have white tops, heels, and toes and pastel-color backing yarns. Retail price: last year 10c., this year at least 15c. Needles, 176.

23. *Half Hose.* Spiral rayon and acetate with mercerized top, heel, and toe. Will be found in chain-store 19 and 20c. lines and jobbing 25c. lines. Dark colors sold from March 1 to August 1 will probably be in minority, bleached tops, heels, and toes with pastel-color backs predominating. Needles, 220.

24. *Half Hose.* Genuine wrap with all-rayon body for chain-store 29c. lines and jobbing 35c. lines. Dark colors are popular the year round, but a large percentage of bleached and pastel goods of this type will be found this summer. Needles, 220.

25. *Half Hose.* Genuine wrap in fine gage destined for department stores to retail for 50c. and up. Lisle over acetate is becoming increasingly popular. Patterns will be neat, and colors will be about equally dark and lighter pastels. Needles, 260.

26. *Slack Sock.* Bleached top, heel, and toe and pastel-colored body. Believed to hold promise for coming season. Needles, 220.

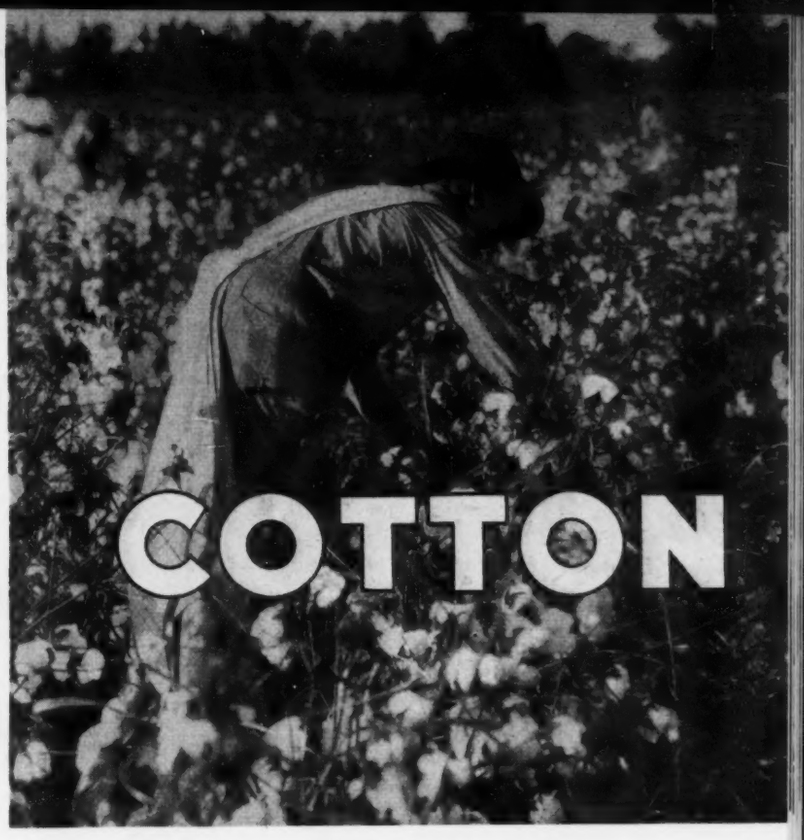
27. *Knit Dress Goods.* Wide-stripe effect of type now being extensively used for sport dresses and suits. Produced on 10-cut jersey-stitch machine.

28. *Knit Summer Dress Goods.* Produced with 3x1 long-latch dial needle, 1x1 tuck stitch, double set of cams in dial for long and short needles. Light weight. Two colors, such as blue and white.

29. *Knit Winter Dress Goods.* Popular this winter and next. Rib knitted in 1x1 tuck with two colors so arranged that when fabric is slightly stretched vertical stripes appear. Can be knitted plain at waist line for shaping.

1933 Recovery

FURNISHES SOUND BASIS FOR PROFITABLE OPERATIONS IN COTTONS



THE cotton textile industry, exhibiting remarkable vitality in the early summer, proceeded to bowl over records of long standing during the eventful months that followed. Expanding with extraordinary rapidity in May and June, as buyers anticipated the effects of NRA regulations and the processing tax, operations continued at a lively pace throughout the fall. Raw cotton prices, spurred upward by increased consumption and monetary developments, climbed steadily to reach their highest peak since June, 1930. With red ink disappearing from their statements, mill executives faced their directors and stockholders with renewed confidence and, even more encouraging, reports showing profits for the first time in years. The industry's recovery during 1933, as reflected in the comparative figures that follow, was a thrilling drama.

June High for Consumption

Cotton consumption in the United States, after an erratic start, jumped to 697,261 bales for the month of June, and declined, with the exception of a slight increase in October, for the remainder of the year. Total consumption for 1933, however, was 23.8% greater than that of the previous year, and 6.7% above the five-year average, 1929–33, inclusive. This high rate of domestic consumption, plus exports of 8,353,449 bales during the year, brings the total of American cotton going into consumer channels to approximately 14,564,700 running bales. Since this figure is larger than the size of either the 1932 or 1933 crops, some of the burden of the excessive carryover has been removed, and the statistical position of raw cotton greatly improved.

Cotton's Price Advance

Cotton prices joined the uphill procession with other commodities under the influence of New Deal economics. From the low quotation of 5.90c early in February, New York spot cotton jumped to 6.85c upon the resumption of trading after the National "banking holiday," reacted temporarily toward the last of March, but moved upward until July 18 when 11.75c was reached. In studying the chart showing the raw cotton price index, which is based upon average prices for each month, it should be remembered that index computations since Aug. 1 include the processing tax. New York spot quotations closed the year at 10.30c.

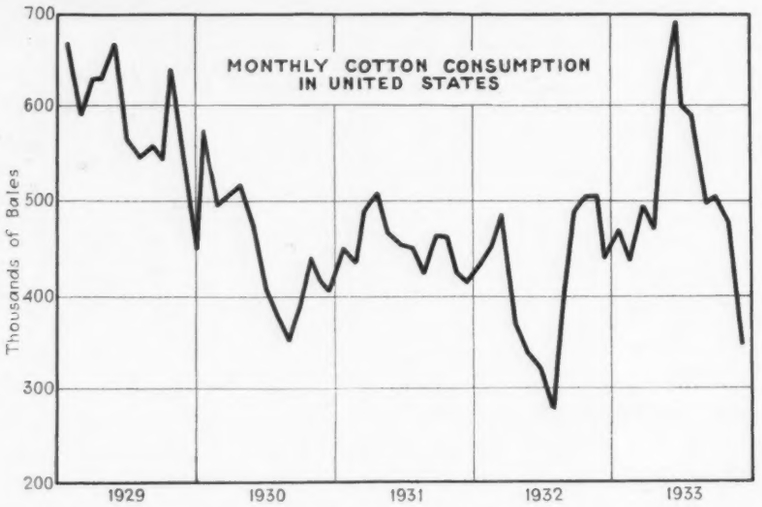
Spindle activity by months, closely corresponding to fluctuations in cotton consumption, was at the average rate of 101.4% of single shift capacity, as compared with 79.9% in 1932. The average number of active spindle hours per month, approximately 7,217,200,000, was somewhat reduced by 25% industry-wide curtailment in December. There were about 2,650,000 spindles active in July that were not in operation during April, representing an increase of 11% over the spinning equipment active prior to May.

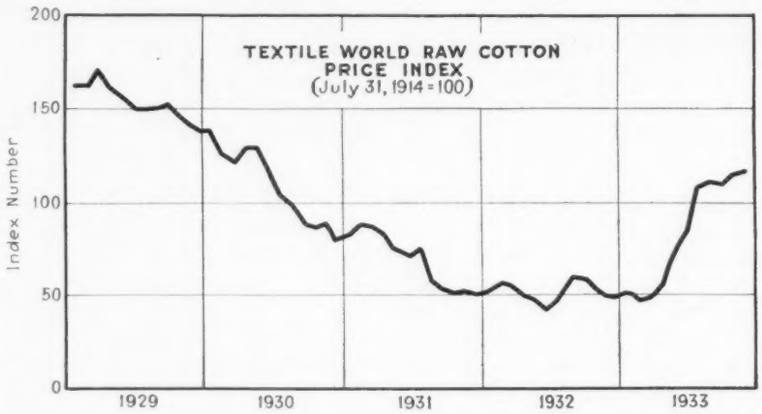
Statistics on production, sales and stocks of cotton goods, for many years issued by the Association of Cotton Textile Merchants of New York, were discontinued early in 1933. Therefore, comparison of cotton goods volume with reports of previous years is impossible, and it is hoped that the publication of such trade statistics will be resumed. United States exports of cotton textiles for the eleven months ended Nov. 30, 1933, included 283,967,070 sq.yd. of woven goods, 8,147,414 lb. of carded yarn, and 3,202,684 lb. of combed yarn,

Textile Stocks on New York Exchanges

COMPANY	For 1933 HIGH	LOW	CLOSING PRICE
*Amoskeag	11	1¼	9⅛
Cannon Mills	35½	14	29
Collins & Aikman	26	3	20
Consolidated Textile	3¼	¼	1⅛
Pacific Mills	29	6	27
*Pepperell	83½	26⅛	78

*Listed on New York Curb. Other quotations from New York Stock Exchange.





according to the Bureau of Foreign and Domestic Commerce.

Financial reports issued by cotton mills for fiscal periods ending in 1933, almost without exception, show substantial improvement over the previous accounting period, and in many cases profits have supplanted losses. Manufacturers were not forced to charge off the heavy inventory losses that were made necessary by the declining raw material prices since 1929. Although the change from red ink to black was sufficient cause for rejoicing in the industry, profits have been comparatively small in the majority of cases, and the improvement in manufacturing margins will have to continue for some time before cotton mills enjoy full measure of prosperity.

Taking the statements of seven large cotton manufacturing organizations, selected at random with four located in the South and three in New England, representing a total of about 2,000,000 spindles and capitalization of $77,000,000, we find that total net profits, after depreciation and reserve contingencies, of these mills for fiscal years ending in the last quarter of 1933 came to only $3,004,000. This represents earnings of approximately $1.50 per spinning spindle, or but 3.9% on capital invested. These same mills, however, suffered losses aggregating $2,754,000 for their fiscal years ending in 1932. The demand for cotton mill securities improved materially during the last half of 1933.

Cotton and Cotton Textile Prices and Activity

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1933 Monthly Average	1932 Monthly Average
Textile World Index Numbers:*														
Cotton	50	48	49	56	69	76	86	110	111	110	114	115	83	51
Yarns	72	68	70	74	93	109	138	170	156	152	146	146	116	75
Gray Goods	67	65	66	72	94	117	135	151	149	141	132	131	110	73
Colored Goods	100	95	96	97	101	112	131	147	147	144	144	144	121	100
Key Quotations:**														
Spot Cotton (N. Y.)	6.00	6.05	6.30	7.90	9.35	10.15	10.50	9.45	9.95	9.75	10.10	10.30	8.81	6.36
10s Frame Spun Carded Yarn	12c	11⅛c	13c	15⅛c	18c	22c	29c	29⅛c	29c	27⅛c	26⅛c	28⅛c	21.83	13.27
10/2 Carded Skeins	12	11½	13	16	18½	22½	27⅛c	31	30	28½	27½	29½	22.29	13.56
20/2 Carded Warps	14½	13½	15½	19	21½	25½	31½	33½	33	31	30	32	25.08	15.69
60/2 Combed Peeler Warps	37	36	35	45	46	54	64	71	67	61	60	63	53.25	40.71
60/2 Mercerized Cones	55	53	51	52	55	65	78	86	80	78	75	77	67.08	54.37
37-in. 3-yd. Drill	4¾	4¾	4¾	5½	7½	8½	9½	11½	10½	9½	9½	9½	7.89	4.84
38½-in. 64x60, 5.35 Print Cloth	3¼	3	3½	4	5½	6½	6½	6½	6½	6½	6½	6½	5.40	3.58
36-in. 4-yd. 56x60, Sheeting	3½	3½	3¾	4½	6½	7	8	7	8	7¾	7¾	7¼	6.24	4.14
Denims, 2.20	9	8¼	9	9½	11½	12½	15	17	17	15½	15½	15½	12.96	9.54

* Index Numbers and Quotations since Aug. 1 include Processing Tax.
**End of Month Quotations.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1933 Monthly Average	1932 Monthly Average
Cotton Consumption (Running Bales)	470,359	441,203	495,183	470,359	620,561	697,261	600,641	588,570	499,486	503,873	475,368	348,393	517,605	418,084
Spindle Activity														
Active Spindles (Thousands)	23,767.0	23,659.1	23,429.1	23,416.7	24,571.5	25,540.5	26,069.2	25,884.7	26,002.1	25,875.1	25,423.3	24,840.9	24,873.3	23,338.7
Active Spindle Hours (Millions)	6,791.2	6,286.2	7,050.1	6,570.2	8,328.9	9,299.2	8,128.2	7,942.0	7,057.7	7,260.8	6,796.4	5,095.0	7,217.2	5,854.7
Average Hours per Spindle in Place	217	202	227	212	268	301	263	258	229	235	220	165	233	184
Percent of Single Shift Capacity	95.1%	95.0%	93.9%	95.7%	112.3%	129.1%	117.5%	106.7%	99.6%	101.9%	96.3%	73.5%	101.4%	79.9%

Cotton Chronology *for* 1933

JANUARY—W. D. Anderson, George A. Sloan, Charles A. Cannon and others appear before the Senate Committee on Agriculture to oppose the "domestic allotment" plan.

Magruder Dent, Joshua L. Baily & Co., elected president, Association of Cotton Textile Merchants of New York.

Report of Census of Manufactures released showing total value of U. S. cotton goods production in 1931 was 47% less than for 1929.

FEBRUARY — Southeastern Cottons, Inc., successor to Hunter Mfg. & Commission Co., begins operations with Howard E. Coffin as chairman of board.

Association of Cotton Textile Merchants of New York suspends monthly statistics on sales, stocks and shipments of cotton goods.

Print cloth men organized in new group, representing 80% of productive equipment, hold first general meeting and adopt plans for reporting statistical information.

MARCH—New York Cotton Exchange, along with others, closes during bank "holiday" proclaimed by President Roosevelt.

Gaston County Textile Manufacturers Association meets and endorses President Roosevelt's drastic action in banking crisis.

Report on merchandising of cotton textiles, by Dr. Melvin T. Copeland and Assistant Professor Edmund P. Learned, of Harvard, published under grant of the Textile Foundation, suggests vertical mergers to correct many ills.

Carded sales yarn group, representing 1,600,000 spindles, meets in Charlotte, elects A. M. Fairley, chairman; reports operating schedules less than 50% normal capacity.

APRIL—Heavy sales of cotton goods accompanies advances in raw cotton quotations.

New drapery sets, offering outlet for cotton dress fabrics, designed for the Cotton-Textile Institute, find appreciative interest in the trade.

Pros and cons of cork-covered spinning rolls feature of meeting of Eastern Carolina Division of Southern Textile Association.

T. M. Marchant elected president of American Cotton Manufacturers Association, succeeding B. B. Gossett. Resolution adopted protesting against further extension of cotton manufacturning in Federal penal institutions.

MAY — Industry-wide committee appointed to cooperate with the Federal Government in formulating plans for rehabilitating the industry under "New Deal" legislation.

Many southern mills announce wage increases averaging about 10%.

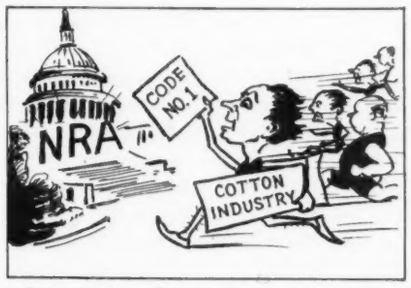
Cotton-Textile Institute receives 1932 Medal of Award presented by American Trade Association Executives, Inc., in recognition of outstanding services rendered by a trade association.

President Roosevelt is advised by George A. Sloan that directors of the Cotton-Textile Institute recommend limiting operations in the cotton manufacturing industry to two 40-hour shifts as maximum.

National Cotton Week (May 15-20) is outstanding success. Slogan: "Everybody Uses Cotton."

Southern Textile Association observes its "silver anniversary"; elects H. H. Iler president.

JUNE—Reconstruction Finance Corp. authorizes $4,000,000 of loans to finance shipment of raw cotton to Soviet Russia.



Cotton thread manufacturers form the Thread Institute with John B. Clark as president.

JULY — President Roosevelt signs cotton textile code, first under the NRA wire, and it becomes effective July 17, limiting hours and wages.

Association of Cotton Textile Merchants of New York issues schedule of "fair differentials" for the adjustment of prices on contracts, carrying the so-called labor clause and placed before the adoption of the code.

Gaston County Textile Manufacturers Association composed of spinners of combed yarns, changes name to Southern Combed Yarn Spinners Association, with R. Grady Rankin, president, and Fred M. Allen, secretary.

AUGUST—Government floor-stock tax, companion to the processing tax, becomes effective Aug. 1.

Cotton Textile National Industrial Relations Board, announced by Gen. Hugh Johnson as consisting of Dr. Robert W. Bruere, B. E. Geer and Major George L. Berry, who had previously acted as the "stretch-out" investigating committee.

Cotton production control program for 1934, intended to limit planting to 25,000,000 acres, announced by AAA.

Pepperell Mfg. Co. reports net profit of $924,000 for fiscal year ended in June, compared with loss of $1,200,000 for preceding fiscal year, typical of improving position of many mills.

SEPTEMBER — Earl L. Milliken named executive director of the Thread Institute.

George A. Sloan reports employment increase in cotton manufacturing industry of 145,515 workers from March to September.

George S. Elliott elected general chairman of Textile Operating Executives of Georgia.

OCTOBER—Ernest N. Hood reelected president of National Association of Cotton Manufacturers. Meeting opposes removal of code limitations on machine hours.

Survey reveals cost of $1.30 to $1.56 per operative per week for maintaining southern cotton mill villages.

A. D. Whiteside and R. E. Loper address annual meeting of the Cotton-Textile Institute. Gain in membership during year of 253 mills with 8,084,000 spindles reported.

NOVEMBER — Cotton Textile National Industrial Relations Board assists in settlement of strikes, involving over 6,000 cotton mill workers, in Augusta, Ga., and Horsecreek Valley, S. C.

A. M. Fairley elected president of the North Carolina Cotton Manufacturers Association.

Cotton converters, represented by the Textile Fabrics Association, decide to operate under the cotton-textile code.

Elroy Curtis elected president of Southeastern Cottons, Inc.

DECEMBER—Compensatory taxes on certain jute and paper products, competitive with cotton, applied by Secretary Wallace, effective Dec. 1.

Blanket curtailment order limiting operations to 75% of maximum allowed under code issued by NRA headquarters to apply for month of December.

Trade practice provisions governing merchandising of carded sales yarn approved by NRA to become part of cotton-textile code, effective Jan. 1.

Cotton-Textile Industry Committee secures legal services in Washington of O. Max Gardner, former Governor of North Carolina.

Varied Speeds

FIND INCREASED APPLICATION IN COTTON MANUFACTURE—OTHER DEVELOPMENTS

NOT so long ago the number of places where it was considered necessary to vary speeds during the regular operation of textile machinery were decidedly limited. Cone pulleys were employed on the picker for altering the rapidity of the feed in order to counteract irregularities in the amount of stock entering the machine. Cone pulleys were familiar on roving frames as a means for reconciling the increasing diameter of the receiving bobbin with the constant amount of roving coming from the front rolls. Compensators were used on range drives in finishing. But in general the cry was for more uniform speed, rather than for varied speed.

The industry is now giving recognition to the fact that a large number of its machines are not, as designed, really suited to constant speed. In many cases a constant-speed drive actually means a varying speed in a vital part of the operation, as in beaming; and in these and other cases it means a varying tension on the material running through. A spinning traveler, for example, when run at constant speed, exerts a decreased drag on the yarn as the warp-wound bobbin builds up in diameter, but frames not equipped for varied speed have to be run slow enough to take care of conditions at the beginning of the spin. A variable-speed drive is of use also simply as a means for readily adjusting the speed of a machine to suit the condition of the material, the temperature, and the humidity, in preference to the more cumbersome and time-consuming gear-changing method.

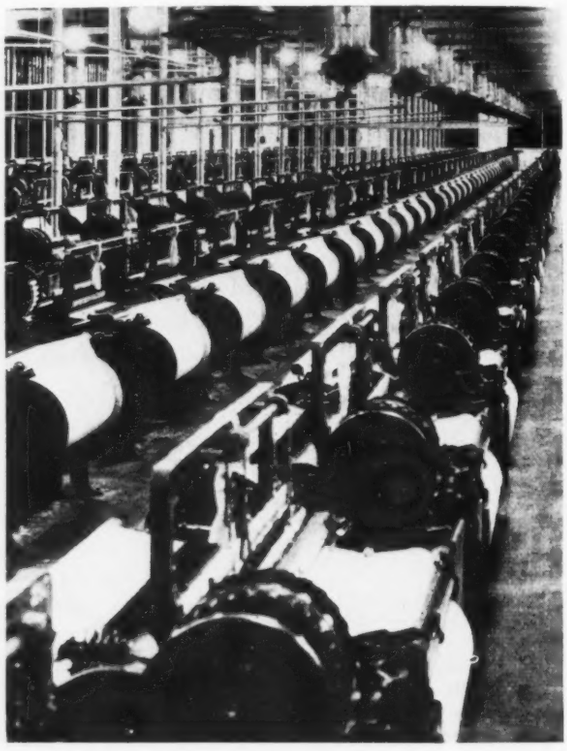
Further application of variable-speed drives to cotton-manufacturing equipment, particularly in spinning and twisting, was a feature of the year. Designed to provide increased production in spinning is a two-speed motor drive, introduced in 1933, in which the starting speed is set slightly less than usual for the initial 20 per cent of the doff (thus reducing end breakage) and then automatically increased to 10 or 15 per cent above the constant speed ordinarily employed. The change from low to high speed is accomplished by a limit switch mounted on the builder lever of the spinning frame, while the increase in motor speed is controlled by a timed relay.

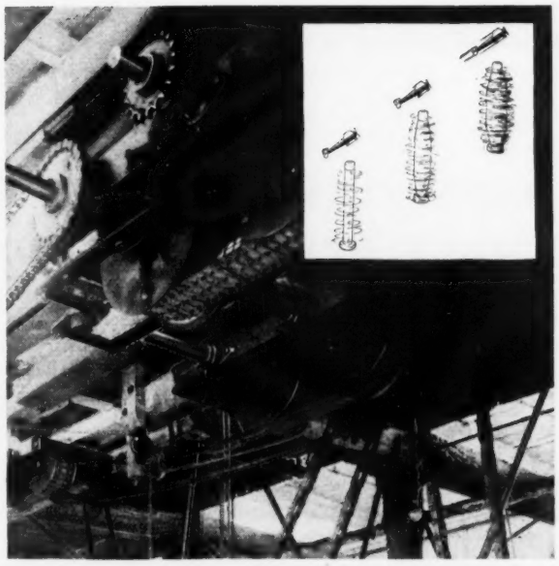
Mill tests on the mechanical variable-speed spinning-frame drives during the year showed production increases of 14 to 25 per cent, as compared with constant-speed operation, on 12s to 21s. More efficient operation of variable-speed drives is obtained on recent types of spinning frames because they are constructed to withstand higher spindle speeds. Experience under normal mill conditions appears to have convinced additional manufacturers that the principle of varying the speeds with changes in the diameter of the bobbin is sound.

Automatic control of the delivery end of a one-process picker, obtained by substituting variable-speed transmission for cone-pulley control, was responsible for a reduction in lap variations from 9.10 to 6.06 per cent, based on differences in weight between heaviest and lightest yarns. In the case of long-chain beaming, constant speed of yarn travel and uniform tension of yarn as the diameter of the beam increases, giving uniform density of the yarn package, are made possible by the application of the variable-speed drive. This type of installation in one Southern mill last year resulted in a production increase of 37 per cent, stepping up average yards per minute of yarn travel from 137.5 to 219.8, while reducing machine time per beam from 72.7 to 45.5 min.

More accurate control of drying time in slashing and elimination of pulley changes and belt slippage are results obtained by the application of variable-speed transmission to slashers, replacing the conventional cones.

Interesting experiments were made toward the development of new drafting systems for spinning. One of these experiments attempts to control the short fibers by means of false twist inserted during drafting. Another seeks the same objective through a constant folding-in of the edges of the roving. Experiments of this character may lead eventually to the spinning of yarn direct from drawing sliver.





Early installation of variable-speed transmission (range finishing) and a recent application (spinning).

The application of long draft to roving frames, the possibilities of which were presented in a paper published in the November, 1932, issue of TEXTILE WORLD, was completed last year and is in successful operation in a Canadian mill. This installation permitted the elimination of all roving machinery with the exception of the slubbers, as the mill is equipped with long-draft spinning. The result was a reduction in the number of roving spindles of 80 per cent and the elimination of 74.2 per cent of the operatives required for the roving processes. On these long-draft slubbers, which have positive gear-driven top middle rolls, a 1.50-hank roving for 32s warp is made from 65-grain sliver with a draft of 11.7.

Perhaps no department of the cotton mill, with the possible exception of spooling and warping, has undergone so noticeable a change in the last few years as the picker room. The widespread adoption of one-process picking has been followed by outstanding developments in methods of blending and distributing cotton to the pickers, and by the introduction of systems of air-recirculation for stabilizing temperature and humidity in that department. One automatic feeding system, developed by a leading machinery builder, replaces the hopper feeders with reserve chambers located above the rear of pickers and fed by a mechanical conveyor. The supply of cotton in the reserve chamber is maintained at constant level by a delicately balanced feeler connected to a mercoid switch that automatically controls the feeding mechanism, as well as the entire opening and blending system.

Another type of cleaning, blending, and distributing equipment, employing the "gyrator" principle, was installed in several mills during 1933. This system, which is an adaptation of a standard machine built in 10-ft. sections, is mounted in some installations in an inclined position behind and above the picker hoppers.

In addition to the adaptation of variable-speed drives to pickers, which has already been mentioned, other developments were the introduction of a new type of one-process-picker change-over equipment and a positive knock-off for pickers intended primarily to replace the worm and worm-gear type of knock-off used on pickers built prior to 1927.

Long-drafting for roving, already discussed, was the outstanding development in the card room. The controlled-draft drawing process, first exhibited to the industry at the Greenville show in 1932, continued to find favor, and several installations of this machinery to replace obsolete equipment were reported during 1933. Other improvements and refinements in the card room included an improved comb box, with better method of lubrication and anti-friction bearings, for both old and new types of cards; a redesigned bobbin-driving mechanism, or "horsehead," for roving frames, so arranged with chain drive that the "gain or loss" of the frame is eliminated; and a spur-gear compound for roving frames to provide uniform tension throughout the build.

Adjustment of spindle speeds of spinning and twisting frames, accomplished independently of the speed of rollers, is made possible by a chain of gears between a new pulley shaft and the tin-roller shaft, including one or more change gears.

Spinning-room accessories announced during the year include reinforced cork cots and a special roll-covering machine for their application to spinning rolls; brass bobbin bushing which prevents rising and wobbling of the bobbin, so that it turns at the same speed as the spindle; and a builder-motion chain-pulley hanger and swivel designed for spinning frames and twisters with long traverse. For twisting where it is necessary to remove kinks from yarn, an interesting creel has been developed which permits an over-end draw from a cone.

Modernization of spooling and warping equipment was undertaken by a large number of mills during 1933, with additional installations of automatic spoolers and extra-high-speed warpers. Cones of twine and cord weighing 20 lb. can be produced by a new winder.

The trend toward automatic control of temperature and steam pressure in slashing continued, while increased emphasis was placed upon the accurate control of tension and stretch of yarn in this process. The major machinery development of interest during the year, however, was the announcement of a two-speed rotary size pump which permits slow speed operation during most of the day and thus avoids excessive wear and time lost for repairs. The year also was featured by the introduction of a new machine for conditioning filling yarn and setting twist by spraying with a special fluid.

There were no outstanding innovations in weave-room equipment although the first sizable orders were placed for some of the recently developed high-speed looms. Among loom accessories which were announced during the year were improved pick counters with better means of lubrication and protection against dirt and the possibility of tampering; shuttle with improved spring-end designed to prevent trouble from loose and broken springs; and a railway track for non-automatic looms to carry a long, heavy shuttle holding two or three times the usual amount of filling.

The recirculating air filter, which was developed primarily for picker-room installations, was adapted to cloth-room conditions during 1933, effecting savings in heating costs and at the same time assisting to maintain uniform humidity in that department. Better layout in the cloth room, with particular attention to the range operation of rolling, shearing, and brushing machines, received more cinsideration during 1933.

CODE NO. 1

WAS NOT ONLY FIRST BUT ONE OF BEST AND MOST EFFECTIVE CODES

RECORDING in this Annual Number any of the history of code-making in the cotton textile industry would be superfluous. Not only the industry itself but the industrial world at large followed the progress of Code No. 1 in the gold-fish bowl at Washington last June, where press photographers and feature writers put cotton textiles on the first pages of most of the papers in the country.

Fortunately, the cotton textile code has more than seniority to recommend it. Ask NRA officials which is the "best" code that has been developed—and most of them will either answer unequivocally the cotton code, or—if they are inclined to be cagey—they will say it is "one of the best."

Of course, the term "best" needs a little explaining. Certainly, the cotton code is simple enough; as originally produced, it didn't please those people who expected to see in a code safeguards against every contingency which might arise in the future. It had to do primarily with the employment aspirations of the NIRA; took up hours, wages, etc., and then arranged flexible machinery by which other problems, such as fair trade practice provisions, could be tackled later.

We imagine that, when NRA officials speak of the cotton textile code as the best, they mean that it was the most effective, or one of the most effective, in carrying out the main purposes of the act. And, certainly, an industry which went from 320,000 workers in March to 460,000 in August—a 45% increase in number employed—and which increased its total payrolls by 111% during the same period, might properly be cited as working under an effective code.

That is for the industry as a whole. Sometimes we find that, if we narrow our field of study more closely, the results mean a little more to us. If we take one cotton textile community, for instance, we can think of the change in terms of inhabitants of a city whose streets and stores and mills we know. So we have charted the effects of the codes on Fall River, Mass., in Fig. 1. That city was probably affected as decidedly by the prolonged textile depression as was any. The chart shows the spectacular rise in textile mill payrolls from May to August, and the relative maintenance of that increase for the balance of the year. It will be noted that the peak month was October—75% above May, and that December, despite organized curtailment throughout the industry that month, was still 54% above May.

On the other hand, the other industrial establishments in Fall River went to a "peak" in September of only 7% above May, and at the closing month of the year were 2% below May. We can't help thinking of this in terms of Fall River textile employees, and realizing that they probably think more highly of the NRA codes than do their friends in other lines. We imagine they think the cotton textile code is pretty good.

Something of the same situation exists in New Bedford. Textile payrolls increased 137% between May 6 and the peak, Aug. 5; were only 10% under that peak on Nov. 18; and, after general curtailment in December, came back within 8% of the Nov. 18 level on Jan. 20.

Why was the cotton textile code not only the first but the best or "one of the best"? We have given a great deal of thought to that question, and our conclusion is that the industry was one of the best organized groups in the country—and thus was all ready to go. The efforts of the Cotton-Textile Institute since 1926 had been in the direction of the NIRA aims. It was comparatively simple for the industry to fit itself in with the psychology of that act.

And when it got its code, it got busy right away administering it. The Cotton Textile Industry Committee divided itself into sub-committees covering all the important phases of industrial self-government. Those groups have done about as conscientious a job as we have ever encountered.

But their job is not over. There is a lot of hard work ahead. Principally, as we see it, this will be along the lines of: (1) working out the most satisfactory plans for curtailment of production; (2) administering equitably the clause limiting installation of additional equipment; and (3) developing fair trade practice provisions for all groups.

Anyone who has followed the attempts of the cotton industry to regulate its production, both before and since the NIRA was passed, realizes how "loaded" this question is. The battles which have been staged in the print cloth group during the last few years furnish eloquent testimony thereto. The fights which sprang up during code-making days when various groups wanted exemption for this or that reason are further evidence.

And yet, with the exception of a relatively few sin-

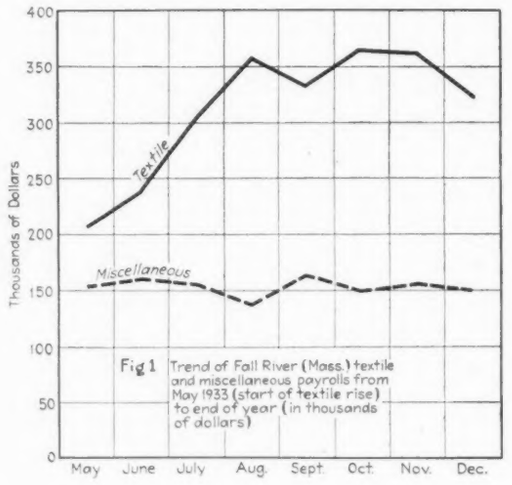


Fig 1 Trend of Fall River (Mass.) textile and miscellaneous payrolls from May 1933 (start of textile rise) to end of year (in thousands of dollars)

cere objectors, the bulk of the industry is in favor of some such regulation as an absolutely indispensable part of the program of cotton manufacturers under the NRA. How to do it, is the real problem. A sound approach has been made by groups, to take the place of the blanket 25% curtailment put into effect in December to meet an emergency.

Equally controversial is the second point listed above: the restrictions on installation of additional equipment. This has been misinterpreted from the outside as a restriction imposed upon the industry by the Administration; and as a complete bar to all technological advance. It is important to bear in mind that, first, the industry itself proposed this limitation and merely received the approval of the NRA; and that, second, the restriction is on purchase of equipment for expansion only, and not on replacement of existing equipment or on installation of machines to bring plants into balance. Furthermore, the sub-committee which has this matter in charge is empowered to recommend expansion if the particular case seems to warrant it. The primary purpose of the provision, of course, is to prevent unwarranted expansion which would tend to demoralize the market and thus work hardships on both management and labor.

It is recognized that the sub-committee mentioned above has a most difficult job. To accomplish the last-named purpose with minimum inequitableness to both individual textile manufacturers and machinery makers is no easy task. However, the caliber of the personnel of the committee and the cooperative attitude of the textile machinery trade promise that this emergency job will be done fairly and yet effectively. It is undoubtedly one of the most revolutionary methods adopted thus far since it encroaches necessarily upon what has been regarded as one of the divine prerogatives of an individual. If it can be accomplished to produce the greatest good to the greatest number, it will prove to be one of the outstanding demonstrations of industrial self-government.

The third principal line of endeavor facing the cotton industry under the NRA is the development of fair trade practice provisions for the several divisions. Supplemental codes for the carded yarn group and for the converting industry have been approved. Completion of such codes for all branches is essential if trade abuses are to be checked and full return on the possibilities of self-government to be realized.

The Industry's Costs and Prices

Speaking colloquially, the cotton manufacturing industry stuck its neck out when it secured Code No. 1. It assumed the penalty as well as the opportunity of the pioneer. It became the target for charges of profiteering.

The situation was complicated by the fact that processing taxes levied under the AAA added to the cost burden inherent in the labor provisions of NRA codes. Furthermore, the scale of prices in effect during the depth of the depression reflected price and wage chiseling, which the recovery program was designed to check. In remedying this situation, and at the same time absorbing the expense of the codes and processing taxes, the industry became fair game for attack.

The showdown came at a public hearing in Washington early in January. Into the record were read briefs by George A. Sloan, chairman of the Cotton Textile Code Authority, and by W. Ray Bell, secretary of the Association of Cotton Textile Merchants of New York. Facts were presented showing absence of exploitation of the situation, as judged by manufacturing margins—and, in fact, failure to return even a modestly fair profit on investment.

Financial statements of mills have shown improvement, of course, but this has been comparative rather than positive, since the cotton textile industry as a whole had been piling up a deficit.

In summing up the history of Code No. 1 during its first six months, it is safe to say that results have been surprisingly satisfactory. Even those manufacturers who in the past have resented any cooperative approach to a solution of the industry's problems seem on the whole well pleased with the operation of the code thus far.

In fact, it is highly improbable that the industry will ever return to entirely unregulated operations. Just what form of self-government will be developed as a permanent plan cannot be forecast just now.

For the present, it is sufficiently gratifying to report that one of the oldest industries in the country has demonstrated its willingness and fitness to determine its future—and to follow through on that determination.

Cotton Industry in Position to Consolidate Its Gains

By GEORGE A. SLOAN

President, the Cotton-Textile Institute

OPERATION of the cotton textile industry under a code of fair competition has passed from the experimental to the practical stage. With six months of experience under the NRA, the industry has learned much about the application and effective workability of its code. Much of the confusion always attendant upon momentous changes in industrial practice has been dispelled. Uncertainty and the inevitable apprehension that unfavorable reactions were possible have been replaced by a high degree of confidence in the administration of the act.

The industry has definite knowledge of improvements effected in many directions. Wage and labor situations have been given stability perhaps not equalled, certainly not surpassed at any other time in the industry's history. While improvement and benefits have been chiefly on the side of the working personnel, this stability has not been without advantages for the mills. Over-capacity, for the first time, has been brought under reasonable control, making for a better balancing of production with current market requirements. Influences formerly contributing to ruinous competition are now held in restraint with a resultant improvement in conditions for the industry and those who deal with it.

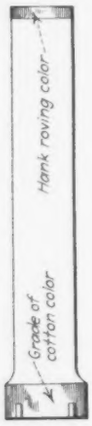
Self-regulation has been found not only feasible, but is proceeding with the helpful cooperation and support of the government. Experience has demonstrated that the code is fundamentally sound. Practice is disclosing better methods for its application. The way to make operation of the code always beneficial on an industry-wide basis, with adjustments for the special requirements of individual groups, is becoming better understood and followed.

Fortified by experience already acquired, the industry is now in a position to consolidate its gains as a foundation for progress in 1934.

• COTTON MILL KINKS •

Avoiding Mixed Roving

For years the problem of mixed rovings has been a vexing one; but we have now solved it in our mill—and in a very simple manner. Our practice is to paint both the bases and tips of bobbins as shown in the accompanying sketch. We have adopted certain colors for certain grades of cotton, and other colors for various hank rovings. The color with which the base of the bobbin is painted indicates the grade of cotton; the color with which the tip is painted indicates the particular hank roving. Thus, if more than one hank roving made from the same grade of cotton is sent to the spinning room, we can identify each hank roving at a glance.

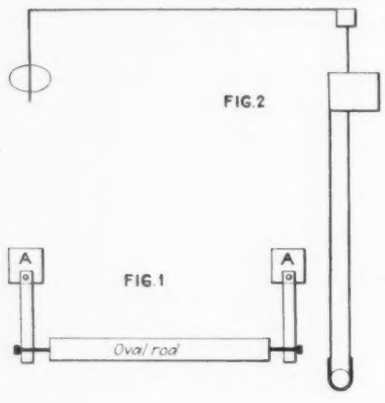


Empty bobbins are removed from each spinning frame which is using the same kind of roving and run through the bobbin cleaner by colors. This system prevents mixing of bobbins and also helps the frame tenders to avoid mixing of colors at the fly frame. The cost of painting the bobbins is more than offset by the reduction in the amount of mixed yarns, bad counts, and other faults due to the mixing of different grades of cotton and different rovings.

F. L. Byrd.

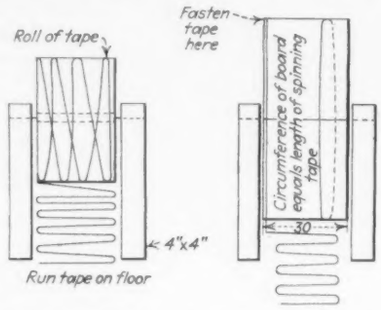
Preventing Drawbacks

Recently we had a warp which apparently had not been properly dried when it was slashed. As a result, the ends had a tendency to stick together instead of separating as they should. This caused them to pull back at the drop wires, thus increasing end breakage or making "drawbacks" in the fabric. In order to remedy this an oval rod (Fig. 1), which separated the ends drawn on the front harness from those drawn on the back harness, was inserted in the warp a few inches back of the drop wires and made to oscillate in the manner described below. Two pieces of angle iron bolted to the top of the brackets *A*, which supported the stop-motion girt, served as bearings for the nails in each end of the oval rod. A bolt was put through one end of the oval rod in the manner illustrated in Fig. 2 and connected to the reed cap by a rod. As the lay moved backwards and forwards, it gave an oscillating motion to the oval rod which separated the ends and prevented any more drawbacks. H.(N.C.)



Measuring Tape for Ring Spinning

The accompanying sketches illustrate a tape-measuring device which has proved of value in ring spinning. I once saw a similar device employed in the manufacture of shoestrings, and since then have adapted the idea to cotton-mill practice. The construction of the device and method of operation are evident from the illustrations. The circumference of the board should be the exact length of a spinning tape. Tape should be first run on the floor to prevent twisting, as it will twist if pulled over the end of the roll. When a sufficient length of tape has been unrolled, fasten one end as shown and wind until the board is full. Do not wind on top of the first layers, as the upper layers of tape would be too long. Wind the tape with a slight tension; and when the board is full, cut the tape by running a knife along the edge where the tape is fastened. This method is speedy and gives uniform lengths of tape. H. W. Swan.



Overcoming Difficulties in Winding and Warping

One of the drawbacks in handling hard-twisted yarns is encountered in warping. Due to the natural weakness of the yarns, it is quite difficult to warp cheaply yarns containing a twist of 8 times the square root. It has been found that when wooden skewers are used, if these are boiled in linseed oil for about 4 hr., they will acquire a surface smoothness approximating that of glass. This results in a considerable reduction in ends down at the warper.

* * *

It was necessary to dispose of some surplus yarns which were on spools and tubes by putting them on filling bobbins. No cop winder was available; and therefore we converted a spinning frame into a winder. To do this it was necessary to alter the relative speeds of the spindles and ring rail so as to obtain a wind of eight revolutions of bobbin to a traverse. That is, we reduced the cylinder speeds radically and speeded up the ring rail by manipulating the rail gearing. A handy contrivance which serves as a guide for the yarn is obtained as follows: Hold in position on each ring a large traveler with a large "circle" by running a wire which extends the whole length of the frame inside of the travelers. Place a second wire on the outside edge of the ring, and hook the travelers on this wire to keep them in the same position at all times. Other details are easily worked out, according to the type of frame being used.

Arthur Ouimet.

Ends Drawing Frame Troubles

We were having considerable trouble with our drawing frames and decided to install a new set of gears on the heads. The number of teeth in each of the old gears was as follows: Front roll gear, 24; calender-hub gear, 45; tension gear, 43; coiler-shaft gear, 28; intermediate gear between coiler-shaft and calender-roll gears, 24; calender-roll gear, 24. Each of the new gears which we installed has twice as many teeth as were in the corresponding gear which was removed. After making this change, we found that the frame ran much smoother than before. There was no longer any rattling noise in the head end, and backlash and slack ends were eliminated. C. A. Dickens.

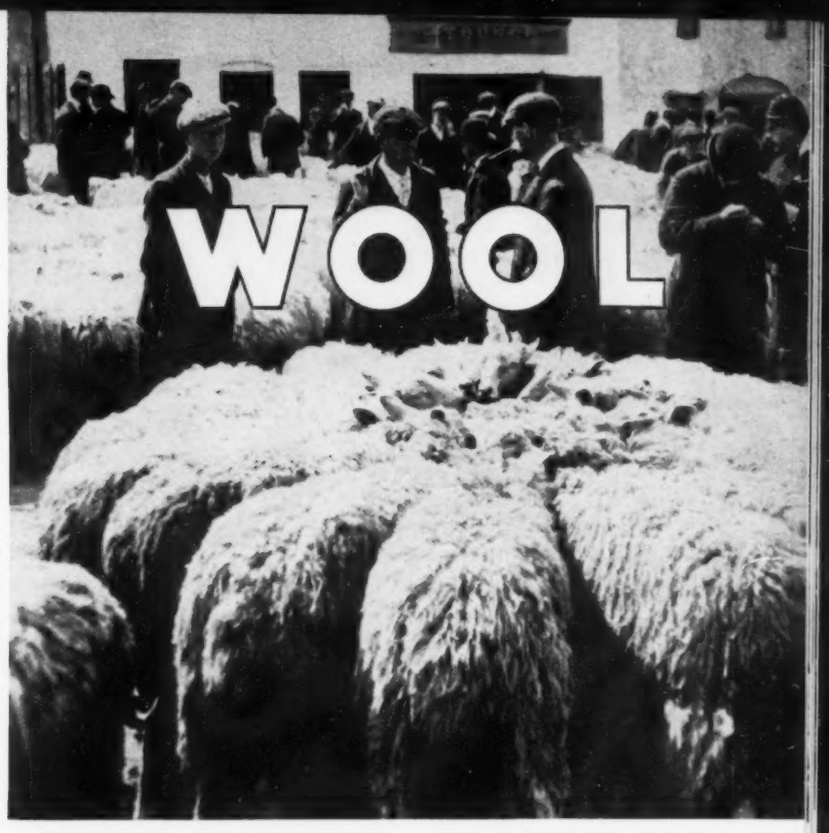
Weaving Elastic Double Cloth

Considerable difficulty is experienced in producing a level piece of goods when weaving an elastic double-cloth, such as is used for shoe goring and heavy suspenders. No matter how carefully the rubber warps may have been made and the uniformity of each individual warp thread maintained, the goods will often come from the press rolls long-sided and irregular. This faulty condition is due mainly to the fact that in weaving double cloth of this character, alternating picks are first light and then heavy, and the clearance of the filling in the shed differs at each pick. The filling will hug the selvage more closely at the heavy lift of the harness than it will on the light lift. This tends to crowd the first several cords together at that side. The crowding at the selvage reduces the size of the outer cavities in which the rubber threads run and to some extent prevents contraction at this point.

To correct this condition the first several dents of the front reed can be made more firm and rigid by lacing them top and bottom with a soft string, as shown in the illustration. This will prevent the dents from springing as they approach the weaving line and will hold the outer cords of the fabric in proper position. Thus, the rubber threads at this point are allowed to contract in the web, making the two selvages more uniform. In addition, steam finishing is not so liable to create long-sidedness.

Firmer Foundation

AFTER YEAR OF BETTER TRADE AND UNITY THROUGH STRENGTHENED ASSOCIATION



PRICES, profits, consumption, machinery activity—all such things seem prosaic when compared with the achievement of the wool industry in building a national organization during the last year. There are reasons for a little enthusiasm on this subject. In the first place it must be admitted that, just because practically the entire industry belongs to the same organization, does not mean that all controversies will vanish. It does mean, however, that the chances for settling such controversies are far better than in the past. Suffice it to say that, although it took time, the highly controversial matter of trade practice rules was settled. The more the industry succeeds in ironing out difficulties the more united it will become.

From the merchandising standpoint the most significant result of the formation of a single, powerful association is that the industry now has a chance really to do something along promotional lines. There have been "Wool Weeks" in the past, and a number of individual concerns have tried to do some educational work, but such efforts have been sporadic and the rank and file of the industry did little more than make gestures of approval. In contrast with such a situation, we now have the possibility of the industry as a unit acting to popularize wool products.

It is too early to say definitely just what will be accomplished in 1934 along promotional lines, but something has already been done in the appointment of a sympathetic committee to study the situation. That the matter will not be allowed to drag along unnecessarily is assured by the attitude of Arthur Besse, president of the National Association of Wool Manufacturers, who stated at a recent meeting that "the way to cure the abuses in the business is to create a demand for the products on such a basis that neither buyers nor sellers will have time to think up new abuses. . . ."

A number of the members of the wool industry will be hard to convince concerning the advisability of a promotional campaign, but the opposition is crumbling as more thought is directed toward merchandising. Not so many years ago any such innovation as the Lastex suit would have been greeted with loud guffaws. It is significant that when such an article appeared in 1933 it was greeted with interest and the sales developments closely watched.

Taking up more prosaic matters, the course of raw wool prices during 1933 brought joy to the heart of the manufacturer. It was impossible to go wrong on the market—unless anyone was so unwise as to sell short—since prices started advancing in March and did not suffer a single set-back. The lucky individuals were those who stocked up in April and May. Since the first of this year, prices have continued to advance slightly and there is nothing on the horizon to indicate a change in the trend. Wool is one commodity where there is no disheartening surplus, and wool dealers seem to have the happy faculty of sitting tight when demand slackens for a period, backed by the stability of the government-controlled portion of the domestic clip.

Unfortunately, prices in the fabric market did not show quite the same pleasing action as raw wool prices. With different mills owning wool at different levels, whenever there was any slackening in demand there was a wide difference in prices quoted for fabrics. This situation was particularly evident in October, when there was quite a flurry of cancellations, and reached its most ridiculous manifestation in November when the highest price on an Army cloth bid was 44% above the lowest. This irregularity will disappear as low-priced stocks of wool are consumed.

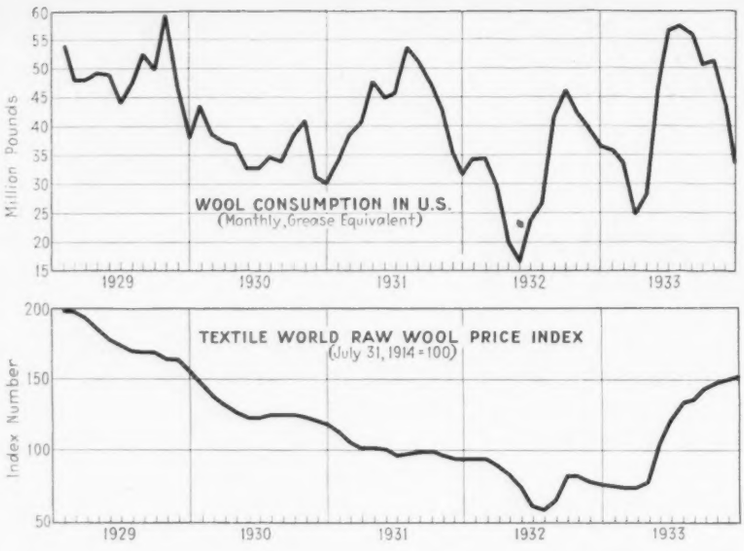
The best way to judge 1933 from a financial standpoint is to glance at the panel which contains such state-

Sample Financial Statements

Company	1932	1933
American Woolen Co. (1st 6 mos.)	$1,809,446*	$197,701
American Woolen Co. (Year)	7,269,821*	7,053,088
Arlington Mills (Dec. 2)	1,111,546*	502,477
Bigelow-Sanford Carpet Co. (Dec. 31)	1,948,737*	1,100,000†
Collins & Aikman Corp. (1st 9 mos.)	579,000*	847,159
Goodall Worsted Co. (Sept. 30)	454,871*	446,951
Hamilton Woolen Co. (Nov. 30)	39,617	283,104
Sanford Mills (Nov. 30)	757,000*	702,584

*Deficit. †Estimated.

ments as have come in to date. Unfortunately there have not been a sufficient number of returns to judge whether the relatively small mills shared in the prosperity, although the medium-sized mills seem to have done well. One feature of the year was that for the first time since 1928, manufacturers did not have to write off large sums for depreciation of inventory.



Profits for 1934 depend almost entirely upon the ability of the industry to adopt a sane price attitude and to forego the jitters every time there is a lull in demand. The latter is particularly desirable since it seems unlikely that volume of business will exceed 1933 or that raw material prices will show anything like the 100% appreciation of 1933. The dominant position of the N.A.W.M. is one of the principal reasons why 1934 merchandising should be better than in past years, particularly since it is probable that some way will be worked out to bring prices out of the realm of the dark and mysterious, and subject them to open air and sunshine. The question of limitation of production has, of course, a definite bearing on profit possibilities and is considered elsewhere in this issue, in the story on the wool code.

Wool consumption for 1934 was approximately one-third greater than for 1933 and the highest since 1929. Examination of statistics for machinery activity shows that the pickup was general throughout all divisions of the industry. The largest percentage gain was recorded by carpet looms, which increased activity by 50% following the first quarter of 1933, but this is not surprising as this division was kicking along at only 25% of single-shift capacity from January to April.

Outlook for 1934

Summing up the year 1933, it may be said that the course of raw materials was favorable, volume of business was good considering general conditions, and the sharp upturn from the bottom created opportunities for profitable operation. To put the matter baldly, while the industry itself helped, outside influences had a lot to do with the showing the mills made. The year 1934 may see less favorable conditions in some directions, since volume of business may not be so large, and it is improbable that raw material prices will advance as sharply. That puts the question squarely up to the industry.

If this happened to be one of the years of the past, the picture would not be particularly encouraging—but this is 1934, and there are new factors to be considered. They are:

1. For the first time the industry has, in the National Association of Wool Manufacturers, a strong, central body capable of directing and coordinating efforts.
2. There has been more cooperation in the wool industry in the last ten months than in all of the last five years.
3. Prospects for a wool promotional campaign are excellent and are about to emerge into actuality.
4. Slowly but surely the industry is become sales-minded.
5. Volume of business in 1934 should be on a reasonably decent level.
6. A return of profits in 1933 already has given an encouraging background.

Add up all the advantages which the industry now has and it becomes obvious that prospects for 1934 are the brightest since the depression—if not since the mid-1920s. If the wool industry doesn't cash in on its advantages, no one is to blame (excluding a national slump) but the wool industry itself.

Wool and Wool Goods 1933 Prices and Activity

Textile World Index Numbers	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Monthly Average 1933	Monthly Average 1932
Wool	76	75	75	78	104	122	134	136	144	148	150	152	116	78
Tops	85	83	84	90	113	139	153	157	177	179	179	179	134	91
Yarn	105	102	102	104	116	135	156	159	165	175	175	177	139	115
Cloth	125	125	125	125	169	192	201	217	222	222	222	222	181	128
Key Quotations*														
Fine and Fine med. terr. wool	$0.42	.41	.42	.51½	.63½	.69	.75	.77	.80	.80	.81	.82	.65	.45
Ohio ⅜s	.19½	.19	.19½	.21½	.31½	.33	.35	.37	.40	.41	.42	.42	.32	.19
Texas, 12 mo	.43	.42	.43	.50	.64	.69	.75	.77	.79	.79	.81	.82	.65	.45
Tops, fine 64-66s	.60	.58	.61	.73	.89	1.01	1.08	1.11	1.16	1.16	1.16	1.16	.95	.64
Tops, average ⅜s	.51	.50	.52½	.62	.80½	.88	.93	.99	1.06	1.06	1.06	1.06	.83	.53
Tops, high ½	.48	.46	.49	.73	.76	.82	.88	.91	.97	.97	.97	.97	.79	.48
Noils, Fine	.34	.33	.34	.41½	.47½	.52	.58	.59	.57	.57	.57	.57	.49	.36
2-40s, 60s, worsted	.90	.90	.95	.97½	1.20	1.32	1.45	1.45	1.62	1.62	1.65	1.65	1.31	1.06
Activity														
Consumption (1,000 lb., Grease)	35,509	33,278	24,943	28,201	46,898	56,688	57,377	55,693	50,478	51,037	43,446	33,569	43,094	32,127
Machinery (% of capacity)														
Combs	84	87	55	62	107	134	134	113	108	108	99	76	97	69
Carpet looms	23	23	22	25	31	44	46	45	49	49	46	35	31	25
Narrow looms	36	36	28	29	46	53	54	51	48	41	39	27	41	27
Wide looms	59	68	43	42	66	87	97	87	73	62	63	57	67	50
Woolen spindles	59	60	42	53	77	100	108	99	82	68	63	54	72	50
Worsted Spindles	56	57	32	35	72	92	96	83	69	65	60	46	64	50

*End of month figure.

Wool Chronology *for* 1933

JANUARY—Pushing dismal 1932 behind them, manufacturers look for better things in 1933, but the opening month is not auspicious. Fabric prices continue below cost of production and demand lags.

Short-stapled rabbit hair (not to be confused with luxurious angora rabbit wool) finds use in wool blend for production of women's wear.

Sydney, Australia, experiments with low-grade wool as paving material. Local Chamber of Commerce does *not* adopt slogan, "Sydney—The Carpeted City."

FEBRUARY — National Wool Acceptance Bank proposed by Emanuel Kaplan of Millbrook Woolen Mills in his book, "A Way Forward for the Wool Industry," which outlines benefits of plan. The trade is skeptical.

Franklin W. Hobbs reelected president of the National Association of Wool Manufacturers.

About 5c. per square foot realized by American Woolen Co. in selling eight abandoned mill properties.

MARCH—Tops reflect change in price trends by registering net gain of 3c. per lb. during month.

American Woolen Co. reports net loss of $7,269,821 for year ended Dec. 31, 1932, compared with $2,836,826 loss in previous year. Annual meeting lasts only 15 minutes and rumors of financial reorganization die aborning.

APRIL — Spot lots of wool advance in price about 20%. Fall goods, priced at first of month 2½ to 10c. below 1932, hastily jacked up 5 to 30c. per yd. Consumption for first quarter 8.9% above previous year.

Farm Credit Administration announces that wool held as security for loans will be merchandised under supervision of committee of five, representing growers, cooperatives, wool dealers and the administration. Viewed as bullish factor since 25% of clip is involved.

MAY—Active cooperation in wool trade achieved. Old American Association of Woolen and Worsted Manufacturers graciously gives way to the National Association of Wool Manufacturers. Harold S. Edwards elected president to succeed Franklin W. Hobbs; Arthur A. Ballantine chosen general counsel.

Raw wool makes sharpest price rise in years, territory group advancing 28% and fleece group 38%. Seller's market in fabrics; prices 40% above openings.

JUNE—Wool consumption at peak, 20,127,000 lb. of clean wool (58,687,988 lb. grease equivalent) entering into manufacture. June, 1932, was 6,947,000 lb., clean.

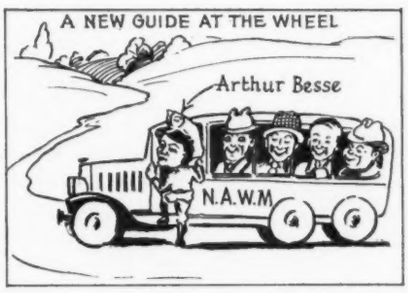
Anticipation of shorter hours under NRA leads to activity in purchase of mill properties by concerns having sales organizations geared to large volume. Several idle plants reopened.

JULY—Wool code submitted by industry and hearings held in Washington. Approved by President to become effective Aug. 14. Provides 40-hour week and minimum wages of $13 and $14, South and North, respectively.

Carded woolen manufacturers and commission combers present facts at code hearing and request exemption to limitation of machine hours.

American Woolen Co. makes net profit of $197,701 for first six months of year as compared with net loss of $1,809,446 for first half of 1932. Best showing since last half of 1927.

AUGUST—Harold S. Edwards resigns as president of the National Associa-



tion of Wool Manufacturers, the wool code having gone through.

National Credit Office chosen by National Association of Wool Manufacturers to shape up statistical work necessary under code, thus assuring disinterested handling.

H. M. Ashby of Kenwood Mills, Millard D. Brown of Continental Mills, Lewis A. Hird of Samuel Hird & Sons, Moses Pendleton of American Woolen, and Ames Stevens of M. T. Stevens appointed members of the Wool Textile Industry Committee.

Mill activity well maintained. Raw wool continues rise. Mills struggle with surcharges under code operation.

Men's suits containing Lastex make appearance. Fabric looks like any other woolen. Athletic gentlemen and mothers

with rapidly growing sons view with interest.

SEPTEMBER—Arthur Besse chosen president of National Association of Wool Manufacturers. He was previously associated with his father in the Besse System, a former chain of clothing stores.

Exemption to machine hour limitation granted temporarily to woolen spindles and worsted combs.

Increase of 4,000,000 lb., or 1%, in the 1933 wool clip estimated by the Department of Agriculture.

Fabric market hits dull period as large production of the summer months is being digested.

Taste of profits prompts mills to carry out modernization, particularly of buildings. Returns still coming in of formation of new concerns to operate small units that have been idle for some time.

OCTOBER—Code for wool trade filed by Boston Wool Trade Association and hearings held.

Much talk of cancellations and deferred deliveries. Inactive demand and some sales by second hands below market do not help. Level heads point out to grousers that wool industry can't boom forever in face of general business conditions.

NOVEMBER—National Association of Woolen and Worsted Overseers celebrates 50th anniversary at annual meeting in Boston with two of original founders present—and the usual "Night Before" even more so than usual.

Brief presented to Secretary Wallace by the National Association of Wool Manufacturers protesting against the imposition of any compensatory processing tax on wool.

Wide range of fabric quotations illustrated by opening of Army bids for shirting to be used by CCC, the lowest price of ten being $1.298 and highest $1.885. Divergence believed due to values at which wool is owned.

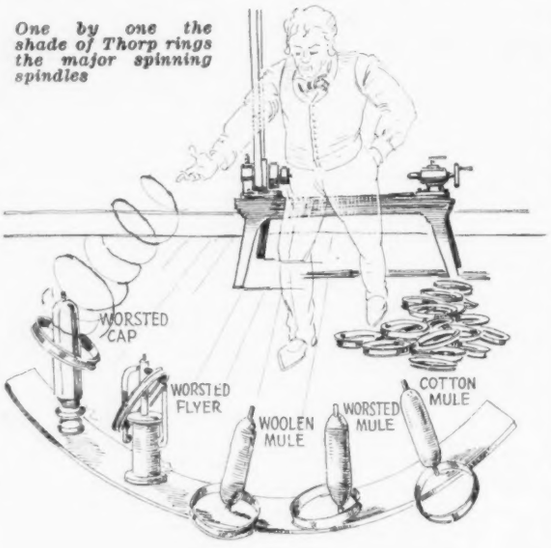
Herbert K. Webb reelected president of the Philadelphia Wool & Textile Association.

DECEMBER — Code authority announced as being comprised of members of former Wool Textile Industry Committee, appointed in August, with addition of Arthur Besse, who holds office ex-officio as president of the N.A.W.M.

National Wool Trade Association, most broadly representative group of its kind ever attempted in the wool trade, starts to function. Robert L. Studley, of Studley & Emery, Boston, elected president. New body is result of need for national body to speak for wool trade in NRA dealings.

Shade of John Thorp

IF JOHN THORP, the Rhode Island inventor who brought forth the ring-and-traveler principle of spinning in 1828, expected his invention to revolutionize the yarn-producing processes throughout all branches of the textile industry, it is unfortunate that he could not have lived a hundred and thirty years or so. He would then have found rather definite assurance that his expectations would be realized. It is probable, however, that he had in mind only the cotton branch, in which he was engaged; and if that is true, he had the satisfaction of seeing his idea well on its way to acceptance while he lived. Possibly he was aware of early attempts to use ring spinning in worsted manufacture. Certainly, he saw little to encourage him in the woolen branch.



One by one the shade of Thorp rings the major spinning spindles

The cap is still dominant in Bradford spinning and the mule is still dominant in French and woolen spinning, but the ring has now established a strong and definite foothold in each, and its eventual supremacy—barring unforeseen mechanical developments—seems assured. A creditable study of worsted-yarn trends published in October by the Wharton School of Finance and Commerce, of the University of Pennsylvania, Philadelphia, disclosed that between Dec. 31, 1925, and Dec. 31, 1932, the number of Bradford ring spindles in the country increased 19% while the number of cap spindles decreased 13%. The study also showed an increase in French ring spindles of 11%, and a decrease in French mule spindles of the same amount—11%. On other occasions we have discussed the reasons for the growing popularity of the ring frame (TEXTILE WORLD, Aug. 1, 1931; Sept. 5, 1931; and Feb. 28, 1933). The large package is a major consideration; and, in comparison with the mule, the high production is important.

In view of these facts, it is natural that the improvements in spinning machinery brought out during 1933 should be confined almost entirely to ring equipment. The improvement which may offer the most change in established methods is the revolving-disk system of long drafting now being applied experimentally to the ring frame, although probably as suitable for other frames. To date the development of this system has been confined mostly to cotton; but if and when it proves successful in eliminating the cotton roving processes, it will certainly be attempted in worsted spinning with a view to eliminating most or all of the drawing processes. Woolen men have expressed the opinion that they might also use the revolving-disk system with the object of employing larger card ropings. It is interesting to note that the principle on which the method is based—namely, a control of the short fibers by means of false twist inserted during drafting—is the same as that on which woolen ring-frame drafting is based, except that the disk method permits far greater drafts—800, for example. The first detailed description of the disk method to be published appeared in the January, 1934, TEXTILE WORLD.

Also on the way is another development which, although it does not affect the spinning frame itself, threatens to reduce radically the number of drawing operations. The Philadelphia machine builder responsible for this development and the one mill, also in Philadelphia, which has made an experimental installation are not ready to divulge the details of the equipment; but it is believed to consist of a battery of intersecting gill boxes feeding a sheet of fiber to a single intersecting gill, the product of this gill being doubled and passed through another intersecting gill, where it is doffed and separated with the aid of a special tape condenser. A prominent mill in New Jersey is understood to be preparing to make the second installation.

But to return to ring spinning proper. An electrically controlled variable-speed drive, designed for alternating current, has been applied to a Bradford-worsted ring frame operating with stationary ring rail and traversing spindle rail. The result is that large packages involving a 10-in. traverse and 3-in. ring can be produced at high speed with uniform tension on the yarn. A so-called auto-lubricated vertical ring on this machine is said to be alone responsible for an increase in speed of 1,000 r.p.m. Another improvement in the machine includes a means for reversing the twist by simply throwing an intermediate gear; and a reinforced scaife motion runs crosswise of the frame, serving both sides. A new French-worsted frame has been provided with practically the same improvements.

The two lines of woolen ring frames have both undergone improvement during the year. To one has been applied a one-shot lubrication system, new safety devices, a sensitive and convenient shipper, accurately counterbalanced spindle rails, an automatic wind-back motion, and numerous other features. To the other line has been added a large-package frame with rings up to 5 in. diameter capable of employing bobbins 12 in. in length and producing yarn packages up to $4\frac{3}{4}$ in. in diameter. In the design of this machine, special attention has been given to increasing the ease with which changes can be made in the draft, tube speed, and amount of twist. At the close of 1933 it is possible to say that yarns have now been successfully produced on the ring system for every class of woolen fabric.

Other interesting developments of 1933 may sooner or later require like attention. One of these is the metallic worsted card. It has long been believed that

FURTHERS RING'S ADVANCE IN 1933— METALLIC CARDS—HIGH-SPEED WEAVING

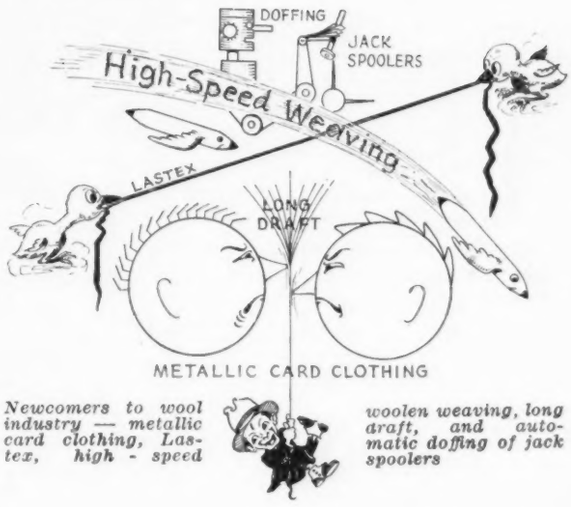
metallic clothing would cut the fiber and hence would be impractical for carding either woolen or worsted—especially, of course, the latter. But again research has apparently proved tradition wrong. Some five leading worsted mills which have already installed the card attest that the clothing, which has been made free of fins and metal burrs, causes less cutting of fiber. The metallic card as a whole, it is reported, increases production on an average of 70.6%, decreases noilage 13.8%, eliminates more burrs and other vegetable matter from the wool, reduces the amount of nep, and practically eliminates stripping and grinding. The same research which developed the clothing indicated that we have been building our cards of unnecessarily large dimensions. If metallic clothing is suitable for worsted, it is unquestionably suitable also for woolen.

Since the high-speed worsted loom made its appearance a few years ago, there have been few outstanding technical developments in wool weaving until the year under review. Now the woolen counterpart of the high-speed worsted loom has arrived. It will produce 6- to 36-oz. dress goods, cassimeres, women's cloakings, blankets, and lighter-weight overcoatings. Its speed range is naturally not so high as that of the worsted loom, but it will produce 82-in. woolens at the rate of at least 128 picks per minute and 92-in. woolens at at least 120 picks. Both looms are 4x1-box, with the exception of a few 2x1 units built especially for Samuel Hird & Sons, Inc. Provision is made for twenty harnesses, of which only nineteen are operative for design work, since the boxes are actuated by the back vibrator.

In construction details the woolen high-speed loom is very similar to the worsted, although it weighs 2,100 lb. more—5,700 lb. as against 3,600 lb. It has a larger magazine to accommodate the $8\frac{3}{4}$x$1\frac{1}{2}$-in. bobbin, as compared with the 8x$1\frac{1}{8}$-in. worsted bobbin. Likewise, the shuttle boxes are larger to contain the standard 18x$2\frac{1}{2}$x$1\frac{1}{16}$-in. woolen shuttle. Instead of the 6-in. throw of the worsted crankshaft, the new loom has a $6\frac{1}{2}$-in. throw. It is built in the following widths: 72, 76, 82, 84 and 92 in. between swords. Although new in 1933, ten mills have already installed a total of 250 woolen high-speed looms. Of the worsted high-speed looms, 40 mills have installed a total of 1,400.

A weaving accomplishment of great interest to consumers as well as technicians, and one which the future may prove to be of considerable importance, is the production of Lastex men's wear. Lastex thread is inserted only every third to eighth pick with a stretch of some 20 to $33\frac{1}{3}$%, which is equivalent to the amount the fabric will stretch after it leaves the loom. The result is a suit or topcoat affording more comfort and freedom to the wearer, a closer and neater fit without discomfort, and a reduction in the pressing required.

There have been other important weaving achievements. One is the perfection of an axminster loom by A. & M. Karagheusian, Inc., Freehold, N. J., which weaves the pile completely through to the back. The result is a better rug and one more closely resembling the Oriental type. Another weaving advance is the application to head-motion blanket looms of an overhead



Newcomers to wool industry — metallic card clothing, Lastex, high-speed woolen weaving, long draft, and automatic doffing of jack spoolers

three-chain multiplier. This is useful for fancy borders—and bodies, for that matter. It affords the same saving as a four-chain multiplier on a cam loom.

There have been other improvements also in the spinning and preparatory-to-weaving processes. From 25 to 50% of the time formerly required for changing bobbins on jack spoolers has been eliminated by a new automatically doffing bobbin stand embodying three rows of bobbin pins pivoted at the same point—one row to be filled while one is delivering its yarn and the other is pointed downward to release the empty bobbins. Jack spoolers are now built in three types—compression with grooved compression roll, compression with plain compression roll and individual guides, and plain without compression roll and individual guides.

During the year several mills installed cone winders and magazine creels for high-speed jack spooling, warping, and dressing. Woolen and worsted winding has been vastly improved by the new slub trap, extensively adopted in 1933, which gives the operator the option of removing a defect or letting it pass if it is not serious.

The woolen mills which have adopted ring spinning are realizing advantages from spinning large filling packages and rewinding the yarn to shuttle bobbins, thereby obtaining 50 to 100% more yards on a bobbin. For automatic looms, rewinding reduces the weaver's waste by providing a more perfect bunch for the feeler; and for non-automatic looms it makes replenishing of the filling less frequent and removes weak places in the yarn. The elimination of knots in filling, which results from the spinning of large packages, reduces loom stoppage and the amount of burling and mending.

Tape condensers continue to forge ahead as the coming standard equipment for doffing woolen cards. Several types were improved in a multitude of minor details during the year, mainly with a view to increasing their production and simplifying their adjustment.

Details of the wool-freezing process under development at Lowell Textile Institute are not quite ready for release, Prof. Edgar H. Barker reports. This is the process which threatens to dispense with raw-stock carbonizing.

The Wool Code

HAS BROUGHT INDUSTRY TOGETHER IN COMMON PURPOSE

IT IS easy to isolate the outstanding accomplishment of the wool textile code to date. It has been the instrument through which an effective and apparently permanent form of cooperative effort has been developed in the industry.

That in itself is worth the price of admission.

Any one who has followed the course of cooperation in wool manufacture during recent years will appreciate the soundness of this comment. The struggles and ultimate demise of the Wool Institute seemed to sound the death knell of coordinated effort for some time to come. A very grave doubt arose as to whether the industry would make another try—and as to whether, if it did, it could succeed. Even those "strong in the faith" began to question the cooperative possibilities of wool manufacturers. And yet the need was very great—because this branch of the textile industry had suffered deflation more keenly than had any other division.

When code-making first came into vogue last spring, the outlook in the wool field was pretty bleak. Long-smouldering antagonisms refused to die; in fact, threatened to flare up with renewed vigor.

But something had to be done—and once more emergency produced the answer. Under the auspices of the National Association of Wool Manufacturers, which had carried on against disheartening circumstances, and with the cooperation of groups formerly allied with the old American Association of Woolen and Worsted Manufacturers, a new start was made. Harold S. Edwards consented to accept the temporary presidency of the former association, succeeding Franklin W. Hobbs, who had served for years but who recognized the need of a full-time executive during this period.

A code was developed and became effective Aug. 14.

Then came the job of securing a full-time executive to carry on permanently. After much deliberation, Arthur Besse was chosen. Possessing a knowledge of the industry, but free from entangling alliances which might arouse competitive jealousies, he quickly secured the respect and support of the industry as a whole.

Today, we have no hesitation in saying that the wool manufacturing industry is well organized and able to govern itself intelligently.

So far as actual results are concerned, it is as difficult here as in any other branch of industry to determine just how much of the improvement has been due to the operation of the code itself, and how much to the growth of confidence generally, and to other causes outside the recovery program. No one can question the fact that improvement has taken place. The sharp increase in wool consumption last year, as compared with 1932—and in fact with previous years back as far as 1929—speaks for itself.

As we write this, however, there are some misgivings as to the possibility of increased consumptive power which would absorb wool goods at the higher levels made necessary by increased costs. The need for further regulation of output is emphasized by many observers.

The code itself places a limit of two 40-hour shifts per week for productive equipment. It is held that the product of such a scale of operations cannot be absorbed under present conditions and that curtailment steps must be taken similar to those initiated by certain of the other branches of the textile industry.

Some manufacturers are vociferous on this point;

Carpet Code Administration Requires Patience and Cooperation

BY HERBERT GUTTERSON
President, Institute of Carpet Manufacturers of America, Inc.

IT IS difficult in commenting on any code including fair trade practices together with labor and wage provisions, to present, perhaps, a just or comprehensive view of such a document. If one specific provision is selected upon which to comment, with omission of others, one might, without intent, lay emphasis where it did not belong or do injustice to other provisions which are equally important.

It is especially true that the code of the carpet and rug manufacturing industry should be treated in its entirety. This industry, from the inception of the National Industrial Recovery Act, was eager to understand its importance and objectives, and in a high spirit of cooperation with the Government it has worked long and hard on the code, which was finally approved by the President on Jan. 12. From the outset the manufacturers have conceived that for the purposes of increasing employment and the stimulation of their business, it was essential to build, adjacent to any structure for hours and wages, fair trade practices to support the increased obligations and costs which were bound to be a part of those provisions to be imposed by the Act or desired by the Government.

Therefore, the code represents a compromise, naturally, among the manufacturers, the Government, and our distribution elements. It also must be remembered that this combined effort is a new field for all the interests above mentioned, and that none of us, therefore, can expect the millennium or 100% accomplishment in this all-important adventure in industrial planning. With such a background and responsibility undertaken, it behooves all concerned to use and preserve the essential elements of industrial planning under such an act and to see to it that it is done in such a way as to preserve, also, that which is consistent and in keeping with our ideals of democracy and the relations of industry to them. We intend to try to administer our code, under all the circumstances, in justice to each other and with consideration to our distributing interests.

Wool Code Effectiveness Depends on Washington

BY ARTHUR BESSE
Chairman, Wool Textile Code Authority

THE degree of effectiveness of the code of the wool textile industry during 1934 will depend in large measure upon the support and help which the industry receives from the NRA officials in Washington.

The units in the industry have honestly endeavored to reconcile certain divergent points of view, they have agreed upon a code and have made a start in trying to bring a reasonable degree of order into a highly competitive and disorganized industry. They have increased wages and have tried to follow out the real intent of the recovery act.

A Code Authority and Sub-Code Authorities have been set up, composed of leaders in the industry who have given and will continue to give generously of their time in an effort to better conditions in the industry. What support will Washington give to the Code Authority? If the NRA will back the Authority in its determination to allow no special privilege and no discrimination, if they will stand behind the Authority in the effort to take speedy steps to restrain and punish violators of the code—the code will mean something to the industry. If, however, the NRA vacillates, becomes tied up with red tape, or shows a disposition to be swayed by pleas of special interests or an unwillingness to take prompt and effective action on violations, then the code will be a dead letter, neither enforceable nor effective. The industry by itself can go only so far—the rest depends upon the backing which can be expected in Washington. And, it should be added, this is not an attempt to "pass the buck"; it is, in reality, a plea for help.

here is a type of comment which certainly cannot be ignored:

"Until such time as the industry deals honestly with itself, but little progress may be expected. It has written too liberal a ticket for itself by adopting two shifts of 40 hours per week, where the actual results show it has operated but 32 hours per week, or less than one shift, and even this operation has contributed much to the present unfortunate situation, in my estimation. Therefore, if we limit ourselves to, say, 30 hours, estimating this would meet the demand, and operate on three shifts of 10 or 12 each, probably we could put some people to work and assist in stabilizing legitimately our market. This would permit employing people now unemployed, who are equipped and qualified to perform their work, as against the 'pork barrel' distribution of the CWA."

The man who said this to us is not a Red. In fact, he is a very capable and intelligent manufacturer. Many will disagree with his opinion on amount of reduction of operation needed. However, so many individuals have emphasized to us their belief in the need for further regulation, that we are convinced this subject will require at least the consideration of the Code Authority in the months to come.

Opposed to the view expressed above is the belief held by many—also able manufacturers—that limitation of machine hours is all wrong. Finding the answer as between these two points of view—an answer which will enable the wool industry to make the greatest possible progress under the NRA—is the puzzle confronting the Authority.

The other major problem is the perfection and enforcement of the various fair trade practice provisions. Here, as in the cotton industry, it was found necessary to develop these by trade groups. Administrative amendments to the code were submitted to permit such group action. Hearings have been held on the supplemental codes for the piece-goods selling division, sales-yarn division, blanket division, and commission combers group.

The psychological stage-setting for these hearings was particularly unfortunate. Consumers' groups and others had their "wind up" so far as any price arrangement was concerned. As a result, open prices and registration of list prices were regarded with as much suspicion as price-fixing. As we write this, the whole question is having the consideration of the NRA, and decision on the fate of the supplemental codes is held in abeyance.

In addition, disagreement with clauses other than the price registration and open-price provisions developed among groups representing jobbers and others. Such controversy is always inevitable in the framing of fair trade practices. Probably no other job encounters more varying shades of opinion.

The encouraging fact is that the industry itself has got together and has agreed upon certain principles. Ironing out subsequent differences is an easy task compared with this primary job which has been accomplished.

It is doubtful if any branch of the textile industry needs a clearing-up of its trade practices more acutely than does the wool division. Codes of ethics—mere statements of policy—have proved ineffective in the past. The possibility of enforceable provisions must be hailed with satisfaction.

Still another problem which concerns wool manufacturers at least as much as it does any other textile division is that of the small mill in an isolated community. In a previous issue, we have set down certain observations resulting from contacts with such companies. About all that has been accomplished to date is the statement of the problem. It permits of no categorical solution. Development of an answer promising maximum fairness to all groups concerned must be forthcoming in 1934.

An important division of the wool industry which recently secured approval of its code was the carpet and rug branch. Its report of statistical progress in 1933 was encouraging. This group is probably more closely knit than is any other wool division. Its possibilities of accomplishment under its code are most promising.

In summation, it is necessary to go back to the beginning. The wool industry is now in better shape to go ahead than it has been for years. Even the seriousness of the problems outlined above is not sufficient to justify pessimism.

• WOOL MILL KINKS •

Preventing Tin-Roller Breakage

On the woolen mule breakages in the tin rollers which drive the spindles occur only too frequently. This causes loss of time, and, it may be, uneven driving of the spindles and unevenly twisted yarn. As uneven sinking of the floor is the most prevalent cause of this trouble, it is more common in old buildings, where the floors are not too sound, than in modern mills. To cure, level up the slips on which the

mule carriage runs by inserting packings where necessary, then check the level of all tin rollers. When the floor and carriage are straight, the rollers will be found to be level.

The same fault will also occur if the rollers are not set parallel to the spindles. To check, make a gage consisting of a straight bar with a movable cross piece in the form of the letter T. Fit the cross piece against the spindles and adjust it until the bar just touches the tin roller. Commence at the mule headstock and check every tin roller at both sides. Periodically the mule should be overhauled by a competent mechanic; but if the spinner will check the settings as described above, he will get better yarns and greater output, and the mules will have a longer life.

Repairing Worsted Spinning Frames

When front rolls on worsted spinning frames are being repaired, it is advisable to install malleable iron male bosses in the first two or three sections. This type of clutch will stand up much better than the cast iron ones in common use. These parts are put on the large gear end where most of the power is applied.

Beaming Coarse Yarns

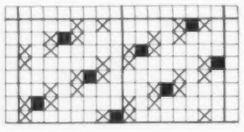
When coarse yarns—such as carpet yarns—are being beamed, stoppages are frequent and "ends out" are above the average. The width of the beam, size of packages in the creel, area covered by creel, distance of machine from the creel and size tank, and the fact that the operator has to attend to both ends of the machine all combine to make supervision of "ends down" a difficult job. In one mill this difficulty has been overcome by installing in front of the creel a frame with a drop wire for each end of yarn. As soon as an end is missing, one of the wires drops, completing an electric circuit and causing a bell to ring. An electrician can install such a device, and can wire it to any convenient place either to ring a bell or cause an electric lamp to light. J. H. PATRICK.

Increasing Production of Warp Yarns

A New England mill was manufacturing an all-worsted fabric required by the U. S. Army. Difficulty was experienced in maintaining the necessary production of yarn for warp, which was two-ply. There was no possibility of increasing production by the usual methods, such as overtime or increased speeds. One method was left—that of increasing production by the use of less twist. It was essential, however, to maintain the strength of the fabric. It was decided to determine the effect of reducing the twist both in the single (filling yarn) and in the ply yarn; and a trial piece was woven and finished. A test of the fabric revealed an increase in strength; and later when a sample was submitted to the government inspector, it was approved as satisfactory in every respect.

Fault in Weaving Worsted Suiting Fabric

Examination of a high-grade worsted suiting fabric revealed a number of defective places on the back of each piece. These defects extended from one selvage to the other in the form of a long backing warp float. The warp in this fabric was equivalent to a 10½s run, 150 ends per inch; the filling was of the same count with 80 picks per inch. The weave was as shown below—a two-and-two twill



face and eight sateen back. The loom in which it was woven was a 24-shaft, positive-lever dobby in good condition. It was a simple weaving job—the warp and filling being good, and the long length of yarn on the 6-in. spools made shuttling very easy for the weaver.

It was found that there were fifteen picks in the float, and the percher stated that he believed the defect was due to a wrong lift. Everything pointed to a loom fault; but careful observation of the loom while it was running disclosed nothing wrong. A study of the design was then made; and this showed that failure of the weaver to find the correct loose pick in case of filling breakage would cause the defect. It took only a short time to prove that this was what was happening and that the weaver was at fault.

It will be noticed from the weave design that there are two repeats of the face weave to one of the back weave. The weaver had seen that there were only four picks in the repeat of face weave, but did not realize that the back was different. When the filling ran off and the loom was stopped by the center filling fork, instead of reversing to find the pick, the weaver turned the loom one or two picks forward. This gave her a loose pick on the face weave, but held loosely by the backing thread. A rule was made that a weaver must reverse every time she has to find a pick; and this fault has not reappeared.

Formula for Mixing Stock for Given Size of Yarn

Recently a rule has been evolved for mixing wool and garnett waste or shoddy for a given size of yarn. A somewhat similar formula was known 30 or more years ago, but the new one is more reliable. The formula is as follows: The square root of the cube of the count multiplied by 5 = % of wool necessary.

Example: To find percentage of wool required in a 2-run yarn—

$$2 \times 2 \times 2 = 8$$
$$\sqrt{8} = 2.82$$
$$2.82 \times 5 = 14.1$$

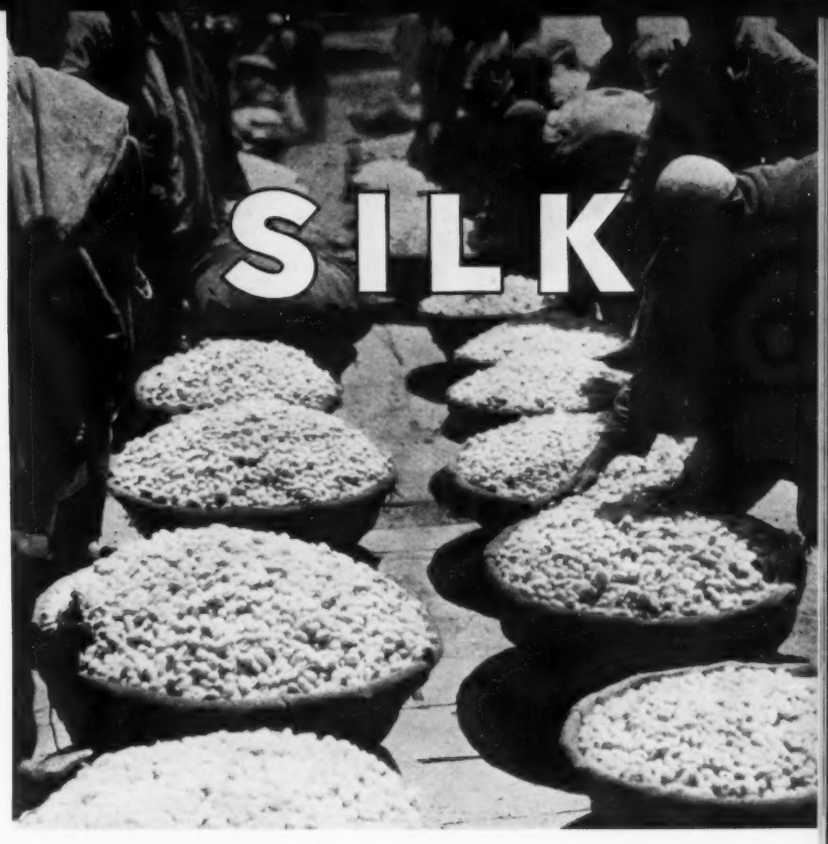
That is, about 14% of wool.

Judgment is necessary in selecting the grade of wool necessary for blending. Good clean shoddy or garnett may be used in the heavier yarns; but for 4-run and finer it is better to use a finer wool and a similar grade of carbonized and neutralized noils. J. M. MASSON.

Cambered Leathers for French Combs

We were among the earliest users of French combs, and in some respects the machines we first obtained were made before the plans were ready. To those familiar with these combs, especially with later models, the slightly convex rollers at the front are well known. These rollers are made convex, or slightly barrel-shaped, to give a good grip on the full width of wool when drawing off. The rollers are about 16 in. wide and 1 in. in diameter, and pressure is exerted on the roller journals at either end. The pressure necessary for good drawing off is sufficient to press the rollers apart at their centers, and bad or weak drawing off immediately follows. Perfectly cylindrical rollers, when under the full pressure applied, draw off weakly, and the fringe left in the nip jaws is uneven in length, resulting in an increase of noil. In place of convex rollers, we prefer to use cambered drawing-off leathers. That is, we increase the grip in the center of the rollers by use of leathers cambered from, say, 9-gage in the center to 11- or 12-gage at the edges, or from 10-gage in the center to 12- or 13-gage at the edges. The thickness of 9-gage leather is 0.148 in.; 10-gage, 0.128 in.; 11-gage, 0.116 in.; 12-gage, 0.104 in.; and 13-gage, 0.092 in.

The same idea can be applied to gill boxes. The cure for "feather-edged" slivers lies in a modified and cambered gill leather. GEORGE HENDRICKS.



1933 PROGRESS MAY

Take the "If" Out

OF SILK IN 1934

IF THERE had been no depression. If there had been no rayon industry. If there had been no weakening of standards in Japan. And if the domestic market had not suffered so acutely from superiority complex regarding the "queen of textiles" . . . It is this combination of "ifs" that contributed so much doubt and doldrums to the silk industry's status during 1933.

From the 1934 point of view, of course, there are various bright sides to the picture. Chief among these are a chastened and enlightened attitude, and a resolve not only to avoid duplicating past errors, but also to take the offensive in remedying the situation. This offensive already has crystallized in concrete steps which give promise for the current year.

The errors themselves are written down so all may read. Statistics tell the story. Silk consumption in the United States declined from 594,889 bales in 1931 to 553,818 in 1932 and to 469,427 in the year recently ended. Obviously, this grave shrinkage is not all the fault of the silk industry—far from it! The basic causes include plenty of unavoidable factors, among which rayon competition and the depression stand foremost.

Let us first review the financial reports of some representative broadsilk mills, important consumers of the fiber. The review discloses certain surprising aspects. Some mills, indeed, would appear, of late years, to have increased their profits in almost exact ratio as they increased their consumption of rayon. Most of the broadsilk mills, however, are rapidly moving from red to black, which is true equally of those using large quantities of synthetic yarn.

In the silk group, one major company, which in the first half of 1932 reported a quarter million loss, was able in the same period last year not only to wipe out this deficit but to roll up a profit of $150,000 as well. Another leading company, also a big silk consumer, which reported over $300,000 loss in the April-to-June quarter of 1932, reduced that figure to $60,000 in the same period in 1933. Most impressive of all, perhaps, has been the improvement in the narrow fabrics division, where one company reported a profit of $125,000 for the first three quarters of 1933, against $10,000 for the same period in 1932.

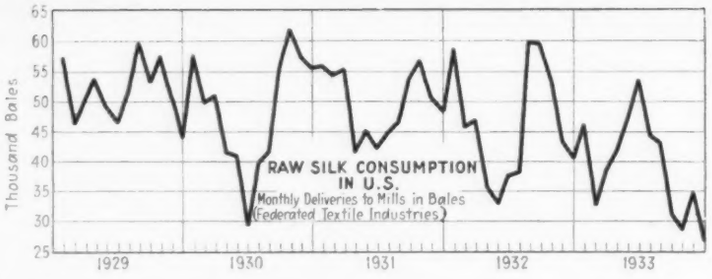
However, this improvement is not due to integral improvement in the raw silk industry. It is due, primarily, to good management of the mills themselves, plus the very vital help of the Government's recovery program.

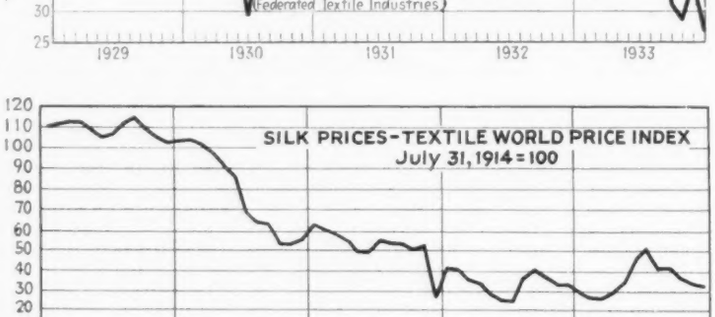
From point of price, raw silk entered 1934 in substantially the same position as it entered 1933. Indeed, in December, 1933, the price of crack double-extra 13/15 white 78% was 5½c. below its own level of the preceding January. Raw silk was sluggish for the major part of the year. The inflation impetus of the mid-summer recovery mood brought crack double-extra up to $2.24, but it slid back rapidly in subsequent months.

Silk's failure to hold its mid-summer gains of 1933 may prove eventually to be the best thing that could have happened for the industry. It demonstrated, in dramatic fashion, the inherent weakness of the market and it crystallized the need for prompt action to preserve silk's status in the consuming branches. Already, indeed, sentiment was shaping toward significant changes. Two trends were of major import: First, the desire of broadsilk manufacturers to throw off the silk yoke—a natural enough wish in view of their constantly increasing consumption of synthetic fiber; and, second, the realization among members of the raw silk industry that they themselves must organize to preserve the identity of, and develop the market for, silk.

The enactment of the NRA codes was a constructive force in that it precipitated a quick and clean cleavage between the fabric manufacturers and their raw material sources, thus eliminating from the fabric picture the controversial silk versus synthetics issue. The broadsilk division, of course, represented majority membership in the historic Silk Association of America, and, since this name was no longer accurate, and also since the set-up itself had become out-dated, a new federation of associations was formed.

This body, which represented both silk and rayon weavers among its many units, took the name of the Federated Textile Industries, Inc. One group of





weavers, whose interests were preponderantly rayon, broke away completely and formed the National Rayon Weavers Association. At the head of the new Federated Textile Industries, Inc., is Paul C. Debry, of Duplan Silk Corp., an outspoken rayon exponent, whose selection as president indicates clearly that the Federated Textile Industries, Inc., tends toward promotion of fabric, irrespective of fiber, and that raw silk will be, at best, a secondary consideration.

Simultaneously the raw silk industry was marshalling its forces for concerted action. The hour which many had long foreseen—which, indeed, Paolino Gerli himself had predicted when last year he intimated that the name of the Silk Association had become a misnomer—was now at hand. The raw silk industry, in examining the new situation, found that it had two main needs: (a) a campaign to revive silk-consciousness among consumers, and thus arrest the constant decline in consumption; and (b) a permanent organization which would perpetuate the associational identity of raw silk, as this fiber had been represented in the old Silk Association. To meet the first need, the International Silk Guild, Inc., was formed early last fall with Paolino Gerli as president. The second need is as yet unfilled, but action may be expected in 1934.

It is clear that the status of raw silk during the current year will depend largely on the success of the Guild's campaign. This promotion is in the hands of E. L. Starr as managing director of the Guild. Appointment of Mr. Starr may prove an astute move, in view of his familiarity with synthetic fiber merchandising gained while director of the late Rayon Institute.

There is no question, however, that the reinstatement of silk as "queen of textiles" represents an uphill task. The vacillating attitude of the Japanese during 1933 on the question of undertaking such a campaign, the frequent announcements that such a drive would be undertaken, followed by equally frequent deferments, has inculcated in the American textile industry, generally, an unhealthy skepticism toward the whole silk campaign idea. This Doubting Thomas attitude, and the growing importance of rayon as a competitor, represent two of the major difficulties in the path of the silk promotion plan.

On the positive side, however, we find an array of favorable aspects, perhaps equally significant. Among these are: The trend to quality merchandise which has been accentuated by its contrast to the debasement prevalent through the depression; the elimination of the broadsilk weaver from his false position as silk protagonist, which development permits the campaign to focus on him as a customer; and last, but not least, the abandonment by the silk industry of its traditional policy that silk "did not need to be promoted."

Certainly, we may look for improvement over 1933, which year from the point of merchandising was marked chiefly by sporadic pick-ups and subsequent declines. Fashion did its best to stimulate silk consumption by sponsoring the glamor vogue, and this lent a new zest to broadsilks. Specialty fabrics were important throughout the year, and silk-back velvets enjoyed the sales spotlight for many months. Mossy crepes were helpful, prior to their decline into the low-priced rayon field. As the year closed, a number of silk manufacturers reported inordinate carryovers of higher-priced mossy crepes.

Demand for silk from the hosiery industry, while not preponderant, was steady, and indeed there were times when hosiery mills appeared to be the mainstay of the silk industry. Frequently, however, the quality of hosiery silk received from Japan was so inferior as to cause both complaints and cancellations.

This, then, is the picture of raw silk: Looking backward—and looking forward. If there had been no depression. If there had been no rayon industry. If . . . but the new program would indicate strongly that silk aims to eliminate "if" from its vocabulary during 1934. And certainly there are no "ifs" in the plans as developed to date.

Silk Prices and Mill Activity for 1933

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1933 Monthly Av.	1932 Monthly Av.
PRICES														
Textile World Index Number														
Raw Silk	29	26	26	29	34	47	50	41	41	36	33	32	35.4	33.1
KEY QUOTATIONS*														
Raw Silk Crack XX 13/15, white 78%	1.50½	1.22	1.20½	1.22½	1.63	1.73	2.24	1.85	1.95	1.87½	1.57	1.45	1.61	1.57
Thrown Silk Tram Stnd. Japan 85%	2.25	2.00	2.00	1.95	2.50	2.52½	3.05	3.20	2.80	2.67½	2.55	2.40	2.48	2.50
Spun Silk 60/2	2.50	2.50	2.50	2.50	2.40	2.40	2.65	....	2.95	2.95	2.95	2.95	2.65	3.05
ACTIVITIES														
†Silk Deliveries (approximate bales)	46,204	32,665	38,934	41,910	47,151	53,627	44,597	42,852	31,185	28,521	34,822	26,959	39,119	46,151
Machinery Activity														
Broad Looms, % of capacity based on 36-months average loom hours 1925 to 1927 = 100%	95.3	85.7	60.1	62.9	80.1	79.5	88.1	75.7	59.2	70.0	66.3	....	74.8	71.2
Narrow Looms, loom hours 1925 to 1927 = 100%	60.7	60.0	59.2	68.8	75.0	86.5	86.8	83.8	81.7	82.1	85.6	....	75.4	68.7
Stocks end of month (bales)	69,747	60,459	43,814	43,038	40,125	33,933	51,684	55,515	73,800	93,625	91,122	96,786	62,804	57,815

*First of month. †Includes re-exports.

Silk Chronology *for* 1933

JANUARY—Max Baker, secretary of the Silk Manufacturers' Association of Paterson, goes on record as favoring elimination of night work and limitation of hours to 40 per week.

Rayon issue dominates annual dinner of Silk Association of America. Paolino Gerli, president, bluntly states silk industry must "put its house in order," but remarks that reports of death of fiber are premature, despite many messages of condolence he has received.

Merger of National Raw Silk Exchange with rubber, metal and hide exchanges approved by members; savings due to concentration being the reason.

Throwsters Research Institute gathers in Stroudsburg, Pa., to survey first year of operation. Accomplishments stressed: stimulation to better throwing; listing, investigating and adjusting claims; technical advice on handling rayon; advice on prices.

FEBRUARY—New York office, under Seiji Yoshida, established by raw silk bureau of the Japanese Government.

Deliveries of raw silk for month drop sharply to 32,665 bales, compared with the January total of 46,204 bales.

MARCH — National legislation forbidding employment of any person in industry for more than 30 hours per week endorsed by board of managers of Silk Association at annual meeting. Emergency legislation permitting economic planning and cooperation in production and distribution also urged. Apparently first official recognition by a textile association of what was to come.

With other fibers enjoying a spurt after the bank holiday, silks are comparatively lethargic. Deliveries to mills for month drop 16.7% below 1932 and imports down 42.7%.

APRIL—Greige goods industry, which is pretty well centralized in Greyco Corp., relieved when U. S. Supreme Court renders decision in Appalachian Coals case that centralized selling is not in restraint of trade.

Tatsuji Hara, Japanese Government representative, returns to his native country with evidence of need for cooperative campaign to promote silk. Producers in U.S.A., having heard cry of "wolf" quite often, do not set off fireworks.

Hectic month in raw silk with net advance of 40 to 50c. per lb.

MAY—Committees of various branches of Silk Association appointed to gather data and draw up tentative codes.

Throwsters Research Institute committee drafts plan calling for minimum wage, increased wages and decreased hours.

About 1,000 workers in Paterson silk district strike for 44-hour week and wage scale of approximately $20 per week.

Fabric men encouraged by fact that sales of broadsilks during month are larger than in previous year. Prices uneven but trend is upward. Fall lines slow in starting.

JUNE—Special committee appointed by Silk Association to draw up plans for reorganization. Object is to provide a federated association of all the allied interests. Paolino Gerli requests that he be relieved of his responsibilities as president because of poor health.

Raw silk spurts up about 60c. per lb., 13/15, 78%, white, rising to $2.25 on June 27.

JULY—Silk weaving and throwing industries temporarily placed under cotton

code by executive order signed by the President.

James A. Goldsmith, of Hess, Goldsmith & Co., elected president of the Silk Association at special meeting. Board of managers passes resolution and articles of incorporation are filed for the Silk & Rayon Institute, devised to supplant Silk Association.

AUGUST — Japanese silk delegation, headed by the veteran Senator Imai, arrives in Chicago, inspects silk consuming plants in vicinity, and celebrates "silk day" at the Century of Progress.

Prior to arrival of Japanese silk delegation in New York, the International Silk Guild is formed, Paolino Gerli being the guiding genius. Purpose is to further promotion of silk.

Broadsilk manufacturers and converters adopt the "competitive practices" clauses of the code prepared by Silk Association.

Silk weavers of the Paterson district, after calling off one strike, vote for another as protest against wage and hour provisions of proposed silk code.

SEPTEMBER—Strike of Paterson silk workers spreads to other sections. Many attempts made to secure settlement.

Broadsilk market toned up a bit by fact that strike cuts down available yardage. Prices on favored fabrics turn firm after a sinking spell.

OCTOBER—Despite the fact that the strike keeps production down, the broadsilk market shows few signs of life. Standard constructions do better than fancies.

Silk code approved by President. Strike still in progress.

NOVEMBER—National Labor Board hands down ruling in silk weavers' strike, providing for return to work, piece rates to yield average of $25 per 40-hour week for weavers, and adjustment of other wages to that level. Compromise is reached at end of month on basis of $20.00 to $22.50 for weavers.

Silk Association adopts another new name, Federated Textile Industries, Inc., after trying Silk & Rayon Institute and the Textile Institute.

Paolino Gerli and Julius M. Baer visit Paris and attend the International Silk Conference where discussion of promotional campaign takes place.

Design piracy foes unite as National Council of Design Protection of the American Bar Association. Organization includes Silk Association, American Bar Association, Design Protection Association and Textile Designers Guild. Enactment of legislation will be chief aim.

Silk Code Authority asks for complete statistics on looms and issues rulings concerning pay of watchmen and loomworkers.

Fairly good buying marks opening of spring broadsilk lines. Prints and moss crepes popular.

DECEMBER—Production cut on silk goods for the four weeks beginning Dec. 22, approved by Silk Code Authority and General Johnson. The order sets a reduction of 25% from code maximum.

Paul C. Debry, president of Duplan Silk Co., chosen president of Federated Textile Industries, Inc., (*nee* Silk Association), which begins to function officially.

Ernest L. Starr is named managing director of the International Silk Guild and offices are opened. Mr. Starr previously directed campaigns for Rayon Institute and Durene Association.

Board of governors of Throwsters Research Institute chooses C. J. Knowles, of Pen Argyle Silk Co., as president.

New Grading Methods

BENEFIT THE KNITTER AND WEAVER

◆ *In this article two well-known contributors to* TEXTILE WORLD *review the year's technical progress in the silk field. The section on throwing is contributed by A. Weiss, manager, DuBois (Pa.) Silk Throwing Co.; that on weaving by John Picone, president, Superior Fabrics, Inc., Paterson, N. J.*

THE haphazard manner in which raw silk has been graded and classified has been for years a perennial source of aggravation to the weaver and knitter; and the throwster, of course, has been told that he was responsible for many of the deviations found. The work done by the Raw Silk Classification Committee, the United States Testing Co., and particularly the experiments conducted by Warren P. Seem indicate that within a short time the buyer of raw silk will be able to specify and receive a particular grade based on all the quality components of raw silk. The visual comparison with predetermined standards to determine the evenness of raw silk has long been in disrepute, but it has remained for Seem to point the way with his 9-meter sizing to an accurate and scientific method of determining this most important factor. The adoption of this method plus the promised development of the three-carrier system bids fair to eliminate the word "rings" from the vocabulary of the knitter of silk hosiery.

Despite the financial difficulties which have beset the industry, we have witnessed in 1933 a number of other improvements in methods and equipment. These innovations, as their application becomes more general, are certain to react to the benefit of the throwster and his customers. Since it is almost impossible today to discuss throwing without considering both silk and rayon, in our review of the year's developments in this field we shall not attempt to limit our comments to silk alone.

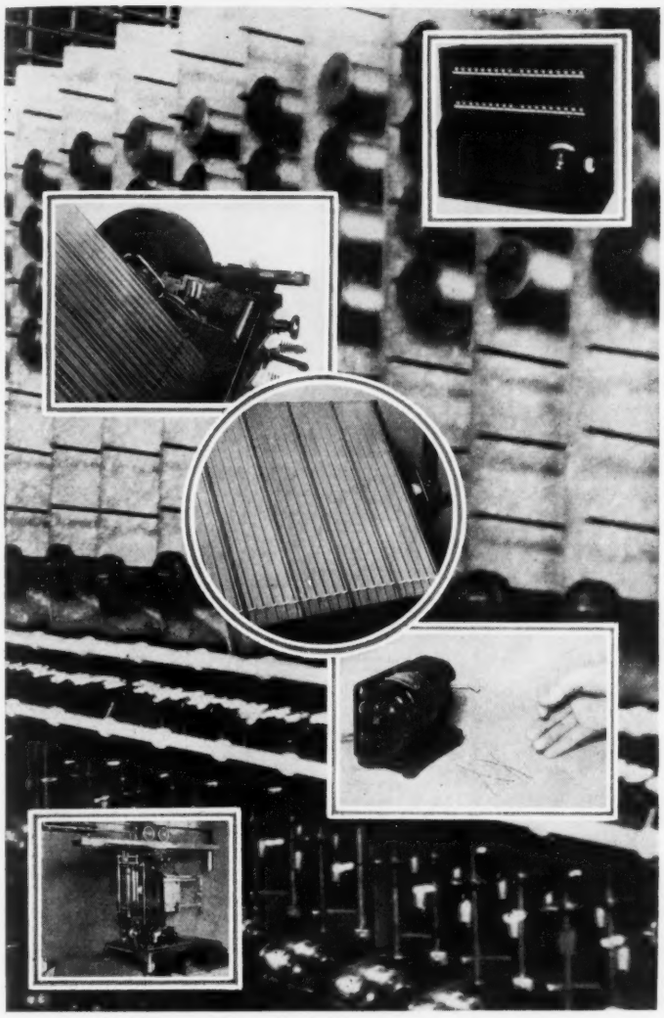
In the past the soaking department of the average throwing plant has been woefully lacking in the knowledge required to help the knitter and weaver, but has been satisfied to meet the immediate needs of throwing-plant conditions. The insistent demands of the knitter for tram which will give him uniformly suitable results and the increasing importance of rayon crepes are both forcing the substitution of the chemists' brains for the soaker's judgment. The determination of pH value of soaking baths and experiments in the use of sulphonated alcohols for soaking are examples of this trend.

Considerable progress has been made in the preparation of raw silk, and, as a result, back-winding and conditioning of cones for hosiery tram may well become an out-moded practice. The silk soaking machine is fast becoming standard equipment, and its acceptance is a step towards the uniform preparation of raw silk.

The year 1933 saw the introduction of no-twist rayon on cones produced especially for the throwster. These cones are tinted to distinguish between right- and left-twist crepe and are oiled to facilitate twisting, twist-setting, weaving, and finishing. As they are produced directly from the rayon producer's spinning package, reeling of skeins and winding to cones are eliminated, and a product results which is substantially the same in cost as skeins. The producers have as yet been unable to shrink this coned rayon to the same degree and as uniformly as skein yarn, neither have they been entirely successful in uniformly lubricating the yarn; but the results in throwing, weaving, and finishing have been gratifying. Throwing cones are now an important factor in the trade; and as the deficiencies noted are overcome, use of the cones may mean the eventual elimination of the soaking tub, the extractor, the dryer, and the skein winder from the rayon throwing plant.

In the equipment field, there has been marked advancement of the oilless principle of machine building. The adaptation of this improvement to the winder, the twister, and the redraw is as important to the trade as was the introduction of the swinging spindle. Gone are the can of grease and the indiscriminate use of redraw friction wheels. Gone also is the chief objection to the use of the double-deck twister. Pastel shades need worry the trade no more.

Another important contribution to the trade has been the elimination of condensation during the twist-setting. The extension of hosiery tram and rayon crepe throwing brought this problem in its wake, and there are now several types of equipment on the market which definitely overcome condensation. The manufacturers of



A group of testing instruments which have improved the accuracy of silk grading

this equipment have, however, neglected to apply full automatic controls, which would assure the redraws a supply of steamed work unaffected by human neglect.

The solid pin creel on the redraw is finally being recognized as a cause of unevenly stretched yarns, and it is fast being dispensed with in favor of the loose-pin or over-end methods. Progress has been made in improving spinning rings, and indications are that ring-stained silk will soon be history. The large double feed rolls now available for doubler-twisters give promise of freedom from roller laps. Discrepancies in making twist and take-up determinations on silk and rayon crepe yarns are overcome with a new testing machine brought out late in 1933.

The improvements mentioned, together with many others, perhaps not as far-reaching in their effect, but important nevertheless, indicate that the throwing industry is progressing and preparing for better business.

[Mr. Weiss' discussion is concluded at this point. Mr. Picone's contribution follows.]

From the viewpoint of the silk weaver, economic changes in the industry overshadowed innovations in manufacturing technic and equipment. During the first quarter of the year business was sub-normal. Came the bank holiday; some mills closed; the majority curtailed production. The banks reopened; conditions rapidly improved; mills which had been shut down for many months again started. The Recovery Act was passed; there occurred an unprecedented demand for machinery—both new and second-hand; looms going begging at $10 to $15 were hard to get at $65 to $90, others jumped from $75 to $300; idle plants were gobbled up and started. Came one of the most paralyzing strikes in the history of the silk industry; for nearly 14 weeks production in the Paterson area was at a standstill. Yet, in the midst of the turmoil, some noteworthy improvements in weaving equipment have taken place.

One of the outstanding machinery developments is an improved silk and rayon 2x1-box loom, the first of this type to change shuttles automatically. A feature of this loom is a handwheel applied to the ratchet shaft of the take-up mechanism. This device removes the danger of grease and oil stains on the cloth, as the weaver no longer has to soil her hands by manipulating the pick wheel. A new easily adjusted release motion for the cloth roll also helps to prevent soiling of the hands, and consequently the fabric. The take-up gear train has been refined to eliminate backlash; thus giving the weaver a better chance to avoid light or heavy joinings.

A further improvement on the loom is the substitution of an angle-iron breast beam for the wooden beam formerly employed. The loom fixer will welcome this improvement, as the old-style beam frequently has been a source of trouble. It often happened, for example, that the holes in the beam wore out, or the beam split at the ends or got out of alignment. These conditions made it impossible to hold the beam in a set position, and bad joinings and inferior fabrics resulted. Even with looms which were but a few months old, the writer has found that the lay was split and that the bracket attached to the beams which steady the shipper handle would fall away when this handle was released, catch under the adjusting screw of the reed cap, and thus prevent the lay from beating up to the fell of the cloth on the first pick. With the new beams these defects will not occur.

During 1933, orders were placed for 4,000 shuttle-changing 2x1-box looms, of which, it is interesting to note, nearly half were from Northern mills.

Of the several interesting developments which have taken place in the construction of shuttles, one is a new shuttle which can be used on both automatic and non-automatic looms. As a result of this innovation the silk mill will no longer find it necessary to keep in stock two types of quills and shuttles. Also has been introduced a new spring device which prevents breaking of the springs and enables production of a stronger and firmer shuttle with less of the block cut away. Still another improvement in this field is an adjustable spindle with a lock setscrew which makes it easier to hold the spindle and quill in a fixed position. This device prevents the quill from leaving the shuttle and thereby eliminates filling breaking caused by falling of the spindle. Also it prevents smashes and chafing, which are due to protrusion of the quill through the bottom of the shuttle when the spindle lies too low in the shuttle. In addition, the lockscrew keeps the spindle at a uniform height, and the weaver has no occasion to bend the spindle and, in that way, cause the quill to break.

Plans of the International Silk Guild to promote the use of silk have now taken concrete form. Successful accomplishment of the Guild's aims should stimulate the silk weaver to utilize these newer developments which make it possible to improve the quality of his output.

Silk Self-Government

BESET WITH DIFFICULTIES BUT PROMISES REAL GAINS

THE silk industry has been through a fight—and knows it. It is still too early to say just how complete a victory has been achieved—but the industry won at least one engagement: the Battle of Washington.

And that *was* a battle! Washington in summer is bad enough anyway, but Washington in summer for a group facing the problems that the silk men did, was torture.

We doubt that any industry formulated its code under more trying conditions. Almost everything was wrong. The silk price structure was undergoing demoralization. Extreme divergence of opinion on wages and hours existed not only between management and labor, but among groups of the employers themselves. Lines of demarcation between silk and rayon had been largely obliterated, and the synthetic fiber had risen to a position of dominance. The question seemed to be: What is the silk industry, if any?

The fact that a group suffering under such handicaps finally managed to get the President's signature on a code (Oct. 7) is a tribute to its persistence. That is why we say the industry won the Battle of Washington.

But there are other engagements ahead.

To this observer, the main problem this division of textile manufacture still faces in its code administration is the enforcement of the wage provisions. The complaints being made in this field differ from most of those heard in other textile branches. They are not so overwhelmingly from labor groups. Perfectly conservative manufacturers have told us frankly that the spirit, if not the letter, of those provisions is being violated in too many cases.

Here is one such comment:

"We know of many cases where ridiculously low wages have been paid in mills, and at least these 'chiselers' have been compelled to pay a reasonable minimum wage. This has had the effect of somewhat eliminating the real cut-throat competition. However, it is still a fact that in many mills, the difference for skilled employees as compared with ordinary employees is not very much higher than the minimum, and I have no doubt that this will eventually be changed in that there will be a fairer differential between the skilled employee and the unskilled. It is true that in many mills, a fair and reasonable differential is now paid, but there are a great many others that do not recognize this fundamental, and they are still in a position to under-sell other competitors at least to the extent of these differentials on the skilled employees."

The clause in the silk textile code covering this situation reads: "The amounts as of July 1, 1933, by which wages in the higher-paid classes, up to $30 per week, exceed wages in the lowest-paid classes, shall be maintained." It is true that it is then qualified as follows: "But no employer, upon obtaining the consent of the Administrator, need increase wages in the higher-paid classes beyond those maintained by other employers who have increased their wages in accordance with the above provision for the same class or kind of labor in the same wage district." However the complaints which have come to us cannot be excused under this ruling.

In view of the fact that a considerable number of manufacturers fought against the adoption of so low a minimum wage scale as $12 in the South and $13 in the North, it seems particularly unfortunate that complaints should now arise regarding the maintenance of differentials above those minima. We are not in a position to know just how many of the complaints are justified—nor to what extent—but we do recognize this situation as offering a challenge to those administering the code.

Still another serious problem is the enforcement of fair trade practice provisions in an industry composed of so many relatively small units. This decentralization has always been one of the outstanding economic weaknesses of the silk industry, and it probably makes itself felt more keenly in this trade practice phase than in any other connection. Here, as in the wage case, complaints of violation are being heard and violators run to the ground.

That the Silk Code Authority is alert to the situation is indicated by the following comments in a bulletin issued by the Authority last month:

"Some members of the industry feel that there should be wholesale prosecution of offending firms. But the predominant policy—at least for the first three months—has been to educate, to convince, to persuade, to create a public sentiment for code compliance, rather than to organize a huge police force and terrorize the industry into obeying the code. This method is slower, but the Code Authority believes it will be more effective in the end.

"For the benefit of chiselers and violators and those who say they intend to run their own businesses any way they see fit, it must however be pointed out that this policy of code enforcement by education applies only to the first three months. By this time it is assumed that the average manu-

Silk Code Strengthening Industry's Position

BY JAMES A. GOLDSMITH
Chairman, Silk Code Authority Committee

THE silk textile industry, considered both individually and collectively, will doubtless find itself in a greatly strengthened competitive position through application of the terms of the silk textile code. Overproduction, selling below cost, and unfair trade practices, the chief evils which have weakened the foundation of the industry during the past few years, are all aggressively attacked in the provisions of the code. With the elimination of these destructive influences, market stabilization may be anticipated, followed by a return of confidence, and expansion of employment. Already the industry has, I believe, felt the steadying influence of the silk textile code, and such will be the case to an even greater degree in the coming months.

facturer has had time to find out what is expected of him, and has made whatever readjustments were necessary in his business. From now on the Code Authority will deal far more strictly with firms proved to be violating the code."

So far, we admit, we haven't been scattering any excess sunshine in this article. We decided to get most of the grief out of the way first. Now for more cheerful tidings.

The silk industry not only got a code but, on the whole, it got a pretty good one. The fair trade practice provisions are directed at certain fundamental abuses. They are designed to prohibit such practices as shipping on consignment or memorandum under the old basis; unfair returns of merchandise; discrimination in terms and prices as between persons making the same or similar purchases; and other unfair methods. Standard terms are set up for each of the various divisions of the industry.

In our opinion, one of the most important clauses in the code is the following:

"No employer shall take orders for, or print, or jacquard weave any design not registered with the Textile Design Registration Bureau of the Silk Association of America, Inc., or its successor; or do any work on any registered design except with the written consent of the person making the registration."

If the NRA did nothing else for the silk industry except to provide a starting point for the elimination of design piracy, it would be worth all the agony it cost the industry's leaders in Washington last summer.

Still another major benefit which the industry is enjoying under the code is the power to effect organized curtailment in order to bring production more closely in line with demand. The exercise of this prerogative for the first time at the end of the year marked an outstanding accomplishment. A 25% production curtailment order was approved by the NRA for the 30-day period commencing Dec. 22.

As the result of this curtailment, plus the effects of the reduction in hours under the codes, the price structure improved materially. As we write this, however, the trade does not feel that price advances have been sufficient to meet the increased costs necessitated by the code and to place the average concern on a reasonable profit basis.

To guard against unwarranted price-cutting in the future, the silk code contains one of those now-famous "below cost" provisions. This one says: "No employer shall sell or take orders to manufacture below his cost of manufacture." But it honestly admits the difficulty involved by hedging in these additional words: "The General Planning Committee shall, subject to the approval of the Administrator, define 'cost of production' for the purposes of this code, and the foregoing provision of this paragraph shall not become effective until such definition has been approved by the Administrator."

Code for Throwing Industry

In addition to the main silk textile code, the code for the throwing industry, sponsored by the Throwsters Research Institute, became effective the same day.

In recommending to the President that the throwing code be signed, General Johnson stated:

"The industry employs approximately 50,000 persons and the annual charges for services rendered approximate $47,000,000. Over 60% do commission throwing. Of the weavers who do no commission throwing [those representing] 846,000 [spindles] have accepted the code, and [those representing] 178,000 [spindles] have not. For this 17.3% of the weavers who do no commission throwing the code has been completely rewritten. This has been done in an extreme effort to avoid regulating throwing as part of the larger process of cloth manufacture and to avoid having rayon mills operate under conflicting provisions.

"In accepting this code the industry is actually placing itself at a competitive disadvantage with the rayon weavers, whom it has agreed to exempt. Until some coordination shall have been established with respect to textile codes, this code will at least provide an even wage rate for the throwing industry and will avoid interfering with rayon mills' operation. It must be regarded as a compromise."

The Administrator referred to certain provisions of the code as "calculated to bring greater orderliness into what has been a chaotic market." Certainly, we regard as one such provision the clause which permits the Code Authority to present recommendations "to further limit the machine hours after a trial period of 90 days if in its judgment, and upon the operating records received, it shall have become apparent that the resulting production is in excess of the needs of those who supply material for processing by the throwing industry, and further thereafter to restore or amend such machine hours as may from time to time become necessary." It is explained that this provision for flexibility is essential for the throwing industry because it has no command over volume, being wholly dependent upon the demands and needs of the weaving, knitting, and allied trades.

Still another code in the silk field which is in effect is that applying to velvet manufacturers.

A Stiff Dose—but Beneficial

Despite the appalling combination of circumstances which was heaped in concentrated form upon the silk industry during code-making days, we believe it is better off for having had to make a code then than it would have been otherwise. The conditions existed anyway, quite aside from NRA considerations. Code necessities forced the industry to face those conditions—and gradually to become a group with a more unified purpose.

We don't believe a manufacturer-friend of ours is guilty of over-statement when he remarks: "All in all, I think the members of the silk industry have been benefited by the code, and would not want to be without it."

Throwsters Hopeful of Stable Prices

BY DEAN HILL
Executive Secretary, Throwsters Research Institute

OWNERS of throwing machinery—whether they be commission throwsters, yarn dealers or weavers and knitters operating throwing plants for their own use only—are looking forward hopefully to a stabilization of throwing prices during 1934 that will bring about profitable operation of throwing plants. These hopes are based on the already uniform hours of labor and wages and the powers given the Code Administration Committee to curtail machine hours. These with the pending amendment prohibiting selling below the actual cost of throwing any particular thread and the open price clause, approval of which by the Administrator is also still pending, will be the instruments used to bring about profitable prices.

• SILK MILL KINKS •

Avoiding Defect in Two-by-Two Weave

Several times within the last week the inspector called my attention to some pieces coming from the same loom which had six picks of the same twist in a regular two-by-two weave. After seeing the first two pieces, I believed that the defect was due to the boxes sticking. However, the third piece had sixteen such defects, and I knew it would have been impossible for the

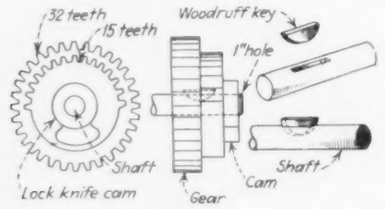


Fig. 1

boxes to stick and cause the defect without a smash or without the weaver seeing the defects. The weaver had picked out many of the defects, but had also passed some which had escaped detection. Calling the fixer to the loom, I found the loom needed fixing, not from sticking boxes as I had first supposed, but from a defect in the vibrator mechanism.

By taking hold of the bottom cylinder gear on the box mechanism, I saw that it was easy to turn the gear at least half an inch, whereas it should have been rigid. In Fig. 1 the cylinder gear is shown mounted on the shaft with the lock-knife cam in place. The lock-knife cam has a set screw to hold it on the shaft, which in turn is driven, the gear and cam turning with the shaft. The cam, when secured, prevents the gear from coming off. The cylinder is held in position with the cam,

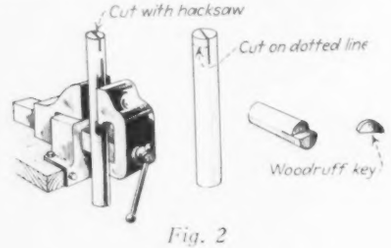


Fig. 2

but is turned by means of a woodruff key as shown. The key had become worn to such an extent that it allowed the cylinder gear to turn, regardless of how tight the vibrator-knife cam was against the gear.

The method used in overcoming the defect is shown in Fig. 2. As no keys such as we needed were on hand, one was made from a piece of round stock. This was placed in the vise end up, and a slot cut in it by means of a hack saw. After cutting the thickness desired, we then placed the stock lengthwise in the vise and cut off the desired width. The new key and the cylinder gear were placed on the shaft, and the cam was next placed in position and the dobby motion timed correctly. The loom was running within 20 min. after the shut-down for the fix. In removing the gears, it is advisable to use a punch to mark the teeth, providing the fixer is not fully familiar with the setting of the gears. H. E. WENRICH.

Blending Silk in Throwing

A few weeks ago we purchased five bales of high-grade silk. We had the throwster put through four bales of this silk in the usual way and reserved one bale for some experimental work. We had a 24-cone sample made up from the one bale with a special soaking. We were knitting the four bales and finishing the hosiery. We were getting about 17% of irregulars, due largely to rings or uneven silk. We put through some samples from the 24-cones; and the irregulars ran to 50%, due to rings and two-tone. We were of the opinion that the great discrepancy in the percentage of irregulars between the two sections of the same five-bale lot of silk was due to a lack of proper mixing or blending of skeins in the small sample. We made the report to the throwster and had the balance of the bale of about 125 lb. thoroughly blended. The stock from this bale then compared favorably in quality with the other four bales. This experience leads us to believe that proper blending of silk will do much to prevent rings and two-color effects in hosiery.

Paper Cap Prevents Tangling of Crepe Yarn

In the weaving of crepe filling it often happens that the first layers of yarn on the quills jump off on the quill boards, and these ends get twisted on the board. The weaver finds it necessary to cut off the twisted ends every time a change of quills is made. Also, if one quill is taken off the board quickly, several other quills may be drawn from the pins, because of the tangled ends. To overcome these difficulties paper caps can be made to fit over the top of the quills as shown in the accompanying illustration. The caps are put on the quills by the filling winders and removed by the weavers when they make a change of quills. After the caps are removed from the quills, they are placed on an empty pin of the quill board and returned to the filling winding department for re-use. B. G.

Grinding Rubber Rolls

In mills running spun silk, rubber-covered front rolls and draft rolls are used to a great extent. These require re-dressing at intervals to remove cuts or abrasions caused by the operators when cutting off snarls or excess caused by broken ends rolling up. The re-dressing can be done successfully by the use of an ordinary cylindrical grinder which has the usual separate driving means for the object to be ground and the grinding wheel. The rolls should be rotated fairly slowly and the wheel fairly fast, say 1,800 r.p.m. for an 8-in. wheel with ¾ to 1-in. face. The wheel should be of medium grit, verging on coarseness, so that the small particles of rubber removed will not fill the surface readily. Take a light cut, and keep going back and forth until all the surface has been removed and the roll runs true. When grinding is completed, rub the surface lightly with very fine crocus cloth to remove any excess rubber; and then for a final finish, rub the surface thoroughly with plain everyday chalk which is free from hard spots. The chalked surface has less tendency to pick up fibers and break down ends. P. S. HUNTLEY.

pH in Silk Throwing

There is a continual controversy among silk throwsters making hosiery tram over the subject of which alkali to use in preparing the soaking bath. A number of throwsters prefer soda ash, others prefer potassium carbonate. It is generally believed soda ash is apt to contain traces of free caustic alkali and impurities, such as calcium carbonate. On the other hand, many throwsters feel that potassium carbonate is milder and freer from impurities. These alkalis are employed in varying proportions, but generally are not used in an amount less than 8 oz. or more than 20 oz. per bale of silk. The average amount of water used in soaking 100 lb. of silk is 70 gal. Therefore the writer has made up various strength solutions and has determined their pH value by the colorimetric method. The result of these tests, which is given in the following table, is self-explanatory.

	Sodium Carbonate	Potassium Carbonate
8 oz. to 70 gal.	9.4 pH	9.6 pH
12 oz. to 70 gal.	10.2 pH	10.8 pH
16 oz. to 70 gal.	10.6 pH	10.8 pH
20 oz. to 70 gal.	10.6 pH	10.8 pH

HERBERT C. ROBERTS.

Blending Noil Silk With Wool

Noil silk blended in the usual manner results in a rough or nubby finished yarn, which is not always desirable. The writer recalls an experience in this connection which caused quite a lot of trouble. In order to cheapen a good-selling women's wear sports cloth, it was decided to blend silk noils with wool; but the results were far from encouraging. In dyeing the stock, it was found that the dye did not penetrate the noil silk thoroughly; and after carding, a distinct two-tone and nubby effect resulted. This difficulty was eventually overcome by adopting the following procedure: (1) The noil silk was boiled to remove any gum which it might contain. (2) The stock was run through the first breaker of the cards once or twice until thoroughly opened out. (3) The wool was blended in the percentage desired, and then dyed in the usual manner. The extra processing of the noil silk reduced the tendency of these fibers to felt, and thereby allowed better dye penetration. Contrary to the general belief, noil silk contains at times quite a large percentage of natural gum which must be boiled out before a smooth and evenly dyed yarn can be made.

Price Stability

IS KEYNOTE OF RAYON'S BANNER YEAR

IT MIGHT seem indeed that the rayon industry was a favored child of the gods. And this observation is made in fullest recognition of the value of good management and sound leadership. The 1933 showing, carrying with it so promising an augury for 1934, could best be said to represent the joint results of intelligent administrative control and helpful trade tendencies.

Viewed from every angle, the progress made by the industry since the publication of TEXTILE WORLD'S 1933 Annual is impressive. A sky-rocket rise in profits; a new high record of production and consumption; an expansion program of unusual scope—these are a few of the features that confront the rayon analyst. But let us climb down from the heights and reduce it all to facts.

The 1933 report of one yarn-producing company shows a profit increase of about 700% over 1932. Another firm, one of the smaller units, netted slightly over $15,000 in the first half of 1932, and reported more than $75,000 profit in the same period last year, a gain of about 400%. While far perhaps from being an exact index of the industry, these reports may be taken as broadly indicative of the improvement. Furthermore, the improvement appears to have carried vertically through the yarn division to certain mills in the rayon weaving division. The profit figures of a leading rayon fabric company have risen by big jumps each year since 1931. This firm's reports during the second half of the depression, read substantially as follows—$140,000 net profit in the first half of 1931; doubled in the same period of the following year; and very nearly doubled again in 1933.

As for yarn production, the figures compiled by the Tubize Chatillon Corp. in *Textile Organon* have already been widely publicized. We will scan them briefly. The 1933 output which represented an approximate equivalent of consumption, totaled 207,600,000 lb., an increase of 54% over 1932. And at the start of 1934 surplus stock was down to the irreducible minimum of three-weeks supply.

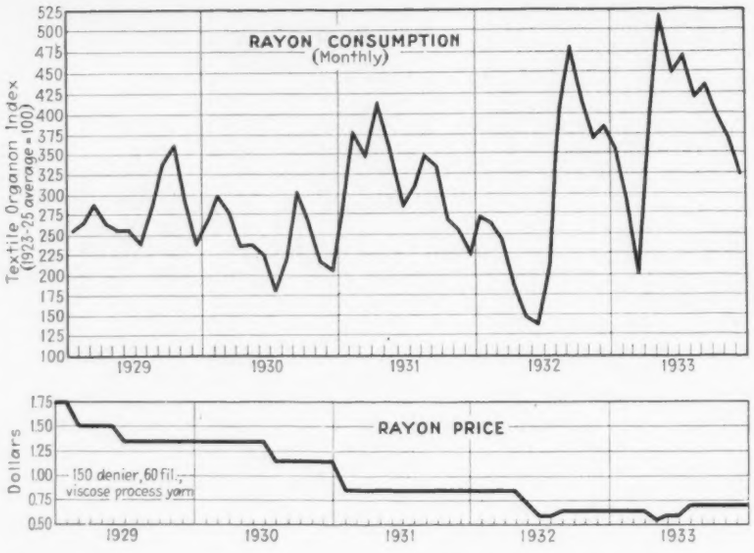
What is the secret of this notably encouraging showing in a year when most other industries were just beginning to get out of the red? The answer finds its roots in a diversity of developments spread through the year. A review of the price situation brings out some illuminating points: 150 denier viscose process yarn opened 1933 at 60c.; in April it fell to an all-time low of 50c., and it started upward soon thereafter until in July it reached its present level of 65c.

The yarn producers refused to be stampeded by the inflation movement of last summer into forcing prices above what the market could safely be counted upon to support—a decision which has since proved to be one of the most constructive features of the year. This policy won back rayon's greatest economic asset, namely, price stability.

Assuming stability to have been the chief attainment of 1933—which it undoubtedly was, as all other favorable factors would have been nullified by its absence—then it is no less true that the second most notable feature of the year was the trend toward expansion. Starting in the summer of 1933, the announcements of expansion programs by leading companies followed each other in rapid succession. The scope of these projects is significant—but no more so than the financial investment they represent. We have made a random computation of the estimated cost of some of the major projects, and these alone add up to $10,500,000. The high-water mark to date is the decision of one firm to spend $2,800,000 on additional equipment.

All of which points toward a decisive increase in producing capacity during the current year. Presumably, producers were influenced to undertake these additions by their sales experiences during 1933. Opening the year in a moderately good position, the industry soon found itself oversold, a condition which has continued with mild deviations until the end of the final quarter when sales slackened due to the normal holiday let-up.

The developments contributing to rayon's record-breaking activity last year were numerous and, in some cases quite unrelated. Textile improvement inspired by the general recovery trend was undoubtedly a major influence. Advancing silk prices helped during the first part of the year, this however proving temporary, as silk



weakened perceptibly in the fall. Fashion, through its sponsorship of the glamor vogue which aided the call for transparent velvets, served to stimulate yarn demand. Labor conditions also were propitious—the yarn industry being free of any major strike—though indeed yarn sales were impeded at times by strikes in weaving and finishing divisions.

It is claimed, too, that market position of yarn was helped by the continued trend toward vertical integration. The Industrial Rayon Corp. now shares with the Tubize Chatillon Corp. an important portion of the tubular knit fabric business of the country.

Last spring the Tubize company bought the equipment of Argus Knitting Mills and began knitting fabric for the underwear trade. In December, 1933, the same firm added further knitting equipment, announcing at that time that its enlarged facilities permitted an annual fabric production of 8,000,000 lb. Proponents of vertical integration as applied to the underwear fabric industry contend that the step has justified itself in two ways: By helping toward price stability in both the knitting yarn and knitting fabric divisions and, by helping to redeem rayon's much-weakened prestige in the underwear industry through improving the quality of the fabric.

The absence of major labor trouble in the yarn industry may be ascribed to various conciliatory moves, including wage increases which represented substantial advances. Another important development in this direction was the introduction of paid vacations. While the immediate outlook as regards labor seems promising, continuation—and indeed even expansion—of the present policy would seem to be expedient, if the industry is to offset pending unionization efforts.

Research and development work continued unabating through 1933, the most notable feature being the progress made toward uniformity of output; this has substantially reduced the quantity of substandard yarn produced in the industry. While it could not be said that there was any pronounced slackening of market expansion activity, the tendency was more toward strengthening rayon's position in existing outlets than toward creating new uses. Rayon's adaptability to the certain of the new chemical finishes and treatments that the year brought forth, such as water-resistant and anti-crease processes proved decidedly helpful from a merchandising point of view.

Despite the progress made toward re-establishing prestige in the knitted underwear field, the most notable gains were in the woven fabric division, and we may look for further substantial expansion of this market during 1934. New and distinctive interpretations of the mossy motif in crepes are already stimulating the spring call for synthetic yarns. With novelty and decorative fabrics enjoying fashion's strong endorsement, the prospects for sales to weavers are unusually promising.

When we assemble together in one unit the three major aspects of rayon's outlook for 1934—price stability, increased capacity, and a consuming market of almost incalculable potentialities—the composite picture is of such a rosy hue that the conservative mind instinctively hesitates to accept it at its face value. Rayon, one might well suppose, has the world at its feet. Yet caution is advisable—particularly as regards the possibility of over-expansion.

Production control, and, through it, price stability, are attributes which rayon possesses to a degree unknown in any other textile division. Add to these advantages, a continuance of the present spirit of cooperation and wise leadership, and the industry this year may well make such a showing as would outdistance even its own notable record of 1933.

Trend Figures for the Year in Rayon

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1933 Monthly Av.	1932 Monthly Av.
PRICES														
Viscose														
75 denier (30 fils)	$0.90	$0.90	$0.90	$0.90	$0.87	$0.87	$0.97	$1.00	$1.00	$1.00	$1.00	$1.00	$0.94	$1.01
100 denier (40 fils)	.75	.75	.75	.65	.72	.72	.82	.85	.85	.85	.85	.85	.78	.85
150 denier (40 fils)	.60	.60	.60	.50	.55	.55	.65	.65	.65	.65	.65	.65	.60	.66
Acetate														
150 denier	.75	.75	.75	.85	.85	.90	.95	1.00	1.00	1.00	1.00	1.00	.90	.97
Cuprammonium														
150 denier (112 fils)	...	...	...	.70	.75	.75	.75	.90	.90	.90	.90	.90	.82	.87
Nitro-Cellulose														
150 denier	.65	.65	.65	.65	.60	.60	.70	.70	.70	.70	.70	.70	.66	.69
ACTIVITY														
Consumption Index (Textile Organon. 100 = daily average 1923-25) unadjusted	353	293	201	392	517	450	470	420	433	399	371	324	385.3	10.9
Imports, pounds	4,633	6,150	5,062	5,885	9,018	44,348	268,542	229,221	172,278	113,029	55,778	20,165	77,842	16,412

Rayon Chronology *for* 1933

JANUARY—Rufus W. Scott, Tubize Chatillon Corp., predicts, for 1933, in TEXTILE WORLD, "I look for very large consumption. . . . . I believe any price fluctuations will probably follow the trend of other basic commodities and be within relatively narrow ranges." (We must ask him for the name of his astrologist.—Ed.)

Leading Parisian dressmakers finally come out in the open and admit publicly that they use fabrics made from synthetic yarns. They previously used and paid cash for such products but omitted the credit.

FEBRUARY — Celanese Corp. introduces line of summer suitings. Of the two types, all continuous filament and continuous filament mixed with spun Celanese, the mixture attracts the most attention.

Described as the first "lacquer" finish chiffon, "Chiff-cire," an all-Bemberg fabric, is presented by Galey & Lord.

MARCH—Rumors in market, on March 3, that Industrial Rayon would reduce prices, but developments of March 4 prompt Hiram S. Rivitz, president of Industrial, to issue statement that higher rather than lower prices seem in prospect.

Sand crepes, woven mostly of 100 denier synthetic fibers, meet sharp increase in demand.

Under decision handed down by U. S. District Court, New Jersey Zinc Co. is held to be owner of patents by which Tubize Chatillon Corp. manufactures dull-luster yarn.

APRIL—Price cut, on basis of 10c. for 150 denier, announced by Viscose Co. in early part of month, with others conforming, but about three weeks later advance of 5c. is made, putting 150 at 55c.

O. Max Gardner, former governor of North Carolina and president of the Cleveland Cloth Mills, Shelby, N. C., appointed legal advisor of the synthetic yarn industry with headquarters in Washington.

MAY—National Rayon Weavers Association formed at meeting in Washington. Eligible for membership are "those who are running any portion of their looms on goods using in the warp all synthetic-fiber yarns." Former-Governor O. Max Gardner of North Carolina appointed advisor.

Spirited demand for synthetic yarns reduces surplus stocks to about 6,500,000 lb. It is estimated that 20,000,000 lb. of yarn were sold during month.

Goodyear Tire & Rubber Co. conducts experiments with synthetic yarn for tire-cord.

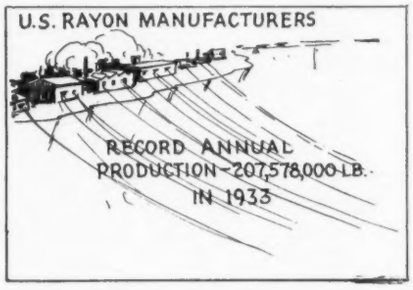
JUNE—Tubize Chatillon Corp. leads parade by raising viscose prices, 5c. per lb. on 150 denier, June 7, and then, on June 28, adds another 5c. making price 65c., or 15c. above April low.

Acetate yarns make two advances of 5c. per lb. each during month, placing 150 denier at 90-95c.

Charles Whitney Dall appointed secretary and treasurer of National Rayon Weavers Association. Offices opened in New York.

JULY—Rayon weaving industry goes under cotton code July 17. Hearings held on rayon code on July 25 center on question whether rayon weaving is separate branch. National Rayon Weavers Association suggests that mills primarily concerned with silk may elect not to be bound by code on their rayon fabrics.

Two largest producers of acetate



yarns request a separate agreement. Deputy-Administrator W. L. Allen advises majority and minority groups to get together. Industry temporarily under cotton code, July 17.

Net profit of $686,241 is reported by Industrial Rayon Corp. for the first six months of the year.

New price lists issued for acetate and Bemberg yarns. Acetate 150 denier, weaving, placed at $1.00. Bemberg list, first issued in years, places 150 denier, untwisted, at 80c.

Tubize Chatillon Corp. announces building program, estimated to cost $2,800,000, which will increase viscose yarn production from 6,000,000 lb. annually to 15,000,000 lb.

Group of circular rayon knitting mills organize as Rayon Circular Knit Fabric Manufacturers Association.

AUGUST—W. H. Furness, resigns as president of Furness Corp. and is succeeded in the management by Dr. Arthur Mothwurf.

Rayon weaving code approved by President by modifying and amending cotton code.

DuPont Rayon Co., authorizes expansion and improvement program at its Kingsport unit to cost about $2,500,000.

SEPTEMBER—Rayon yarn code approved by President. Continuous operation of machinery permitted, with maximum hours for workers to average not more than 40 per week for 4 weeks.

Most rayon producers place ban on allowing discounts for anticipation of payment on invoices.

William H. Furness, formerly of Furness Corp., establishes new concern, the American Rayon Co., Inc., Riverton, N. J.

OCTOBER—First annual meeting held by National Rayon Weavers Association. Parents think the youngster is a husky one.

American Enka Corp. proposes to enlarge plant at a cost of about $1,000,000.

NOVEMBER — Editor of *Textile Organon* suggests that rayon should have a new name. Hastily pulls in his "trial balloon" when small army rushes forward with pins.

Dress goods division of National Rayon Weavers Association moves to curb over-buying. Plan is to have all orders filed with National Credit Office where they will be compiled.

International Silk Federation, at meeting in Paris, finally wakes up and passes resolution favoring use of the word "rayon" instead of "artificial silk."

Expansion program at Cleveland involving $2,000,000, contingent on city building sewer, approved by Industrial Rayon Corp. which also studies plans which might mean an eventual expenditure of $9,000,000.

DECEMBER—Industrial Rayon Corp. initiates upward revision of prices on viscose yarn on cones, placing price 3c. per lb. higher than skeins.

Machinery and equipment of the Janome Rayon Co., Brooklyn knitting concern, purchased by the Tubize Chatillon Corp. which will move equipment to Hopewell, Va., where the knitting machines of the Argus Knitting Co., purchased last spring, are already operating. Purchase will give Tubize capacity of 8,000,000 lb. of tubular fabric annually.

Survey to determine the alleged disparity between wages in silk and in rayon weaving plants undertaken by National Labor Board.

Clean Throwing . . .

IMPROVED SIZING—2 x 1 SHUTTLE-CHANGING AMONG INTERESTING 1933 DEVELOPMENTS

THE oiler, poor chap, has been blamed for many a headache among the mill executives, and the mill executives have often pictured him as considerably more sloppy and careless than he actually is. They see him in their mind's eye gazing at the ceiling and whistling softly to himself as his oil can misses the oil hole and the oil goes pouring down on the spindle belt, where SWISH—it is atomized and spread gently but thoroughly over the yarn all around the frame. Or they see him standing absent-mindedly with the spout resting too long on the take-up shaft above the bearing, or spurting a few experimental drops into the aisle—not primarily to make the winder girls slip and break a bone or two, but just to make sure the oil is flowing freely.

Perhaps it is not so bad as that; but when a customer comes back to the mill with a large claim for oil spots, the management is likely to blame somebody and probably is not too particular for the moment how far its criticism goes. The oiler is only human and no doubt makes nearly as many mistakes as the bigwigs in the office—but the whole trouble may lie in faulty or poorly protected bearings or in bearings so located that they seem to be designed specifically for lubricating the thread, or even in the selection of unsuitable oils.

Our old machines have been running for a good many years on silk and we perhaps have not cared so much as we should whether the silk got spattered or not. With rayon it is a different matter—the removal of oil spots from that material is a serious problem.

It is only within the last few years that we have begun to close in the end frames to shut out the oil flying off the driving mechanism. We have lately installed more drip pans and protector plates and have begun to use more suitable lubricants. Here and there we have applied some oilless bearings and even anti-friction bearings. But never, until this year, has an attempt been made to take the bull by the horns and go the whole way toward banishing oil spots completely.

Oilless bearings have now been applied to new throwing machinery on each and every point where frequent applications of the oil can were previously necessary. The machines involved are the skein winders, double-twisters, twisters, and redraws. The number of oilless bushings required per machine is considerable—544 on a 120-spindle winder, for example, and 96 on a 200-spindle twister. Yet the cost is not high; and in addition to the production of cleaner yarn, the bushings save oil costs, eliminate the oiler, and reduce machine stoppage. Topping all these savings is of course the important reduction in claims due to oil spots. Oilless bushings can be applied to a considerable extent to machines already in operation and to the lineshafting as well.

Besides the oilless-bearing development, there was other progress made in throwing during the year. The reserve oil capacity of spindles was increased. A high-traction rubber tread was applied to winder-spindle heads to eliminate slipping when heavy threads are run. Experiments were conducted on applying the twister type of take-up drive to winders. The introduction of a 30,000-yd. skein reduced winding costs.

A new twister boasts simplified and readily adjusted gearing and is equipped with anti-friction bearings—as serviceable as oilless bearings in eliminating oil spots where they are applied. A new holder was designed for the bobbins on twister take-up drums, so devised as to increase automatically the pressure of the bobbin on the drum as the tension of the thread increases. A new spindle brake makes it unnecessary for the operator to touch the spindle or bobbin in bringing the spindle to a stop, again reducing the soiling of the yarn. A wider choice of doubler-twister feed rolls was made available to suit various yarns.

In the conditioning of yarns on winders steps have been taken to eliminate any effect of the emulsion roll on the yarn tension and to insure a more uniform oil content from the start to the finish of the cone. On certain coners clutches have been eliminated and a slow starting of the spindle obtained by means of a new drive.

The inability of the finisher to obtain the desired handle and drape on rayon and acetate crepes sized with the materials formerly employed necessitated a search for more suitable sizing compounds. Progress to date has resulted in improvements in weaving and the elimination of many of the difficulties formerly encountered in finishing. As yet, however, sizing practice is still far from standardized; and the quest for still better methods continues.

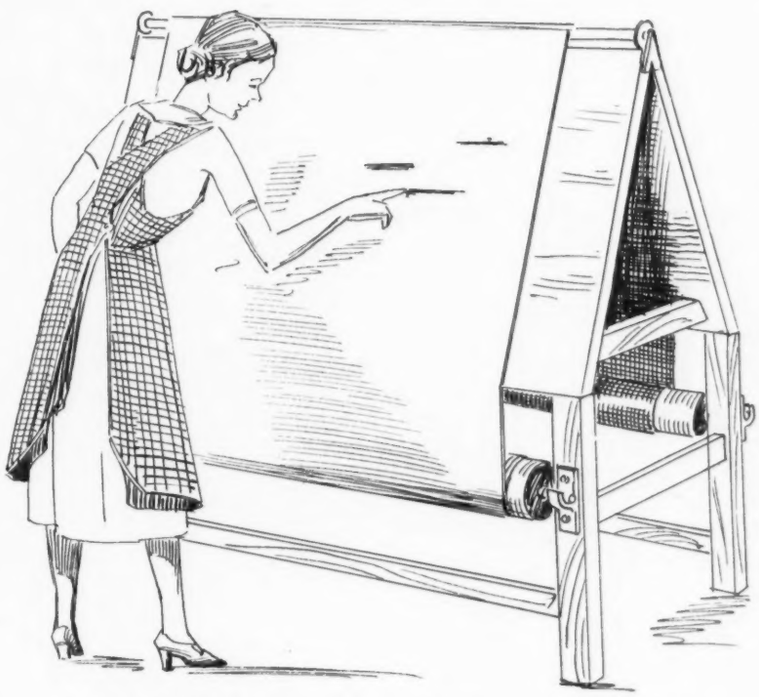
One investigator has stated that a suitable sizing compound must fill four requisites: It must be economical to use, it must have good slashing qualities, it must be satisfactory for weaving, and it must be easily removable in finishing. Animal glue and gelatin combine to a high degree these requirements for a good size; and within the last year these materials have been widely adopted as sizing materials for the synthetic yarns.

Viscose, acetate, nitrocellulose, and cuprammonium have somewhat different characteristics; and therefore no one sizing formula or method of application is suitable for all types of yarn. Consequently various substances, such as thin-boiling starches, certain of the natural gums, and casein glue, are now being employed in sizing; and experiments with other compounds are constantly going on.

A new warp sizing machine introduced last year involves the application of the cotton system to the sizing of synthetic yarns, and is intended to afford exact control of stretch and of the heat applied to the yarn. The quetsch is designed to draw the warp gently from the

various section beams with a dry nip in such a manner as to insure equal tension on all the ends. The warp is first fed to a point where the solution is applied and then, by means of a variable tension control, to the drying cylinders. The take-up has been especially designed to receive all types and widths of loom beams and is ball-bearing throughout. For securing the desired tension between draw rolls and drying cylinders, there is an arrangement by which the drying cylinders are driven from the draw rolls through machine-cut bevel gears, the shaft of which is mounted on self-locking ball bearings. The necessary tension is obtained merely by changing a gear.

Another slasher announced recently is available in two arrangements: one designed for working in connection with the cotton system of slashing, and the other adapted for the silk system of sizing from a single beam made on a horizontal-type warper. The complete machine for slashing by the cotton system consists of four units: a creel unit, a size box unit, a five-cylinder drying unit, and a head-end unit. The complete arrangement for the silk system of sizing consists of two units: the quetsch roll section unit, and the drying-beaming section unit. Instruments are provided to show the amount of stretch caused by the sizing operation and for indicating the total yardage of warps being slashed. Arrangement has been made in the design of the machine to control the tension on yarn at all points.



In the future the throwster may decline responsibility for soiled yarn

Weaving equipment for rayon has undergone a radical change. Particularly notable is the development of and growing preference for the shuttle-changing type of 2x1-box loom. A shuttle-changer lays the first pick after a filling change with the same even tension as other picks.

A single-shuttle rayon loom which was actually developed previous to 1933, but was not offered to the trade until that year, changes the shuttle during the fraction of a section that the shuttle is in the box, without disturbing the operation of any other motion on the loom. In order that the shuttle may be started and stopped with as little shock as possible, this loom is built without daggers or frogs. A "loose" reed, which is loose if the shuttle is trapped, but is positively held during the shuttle flight and beat-up, permits slowing down the shuttle without danger of smashes. The take-up on this loom is automatically disengaged when the machine stops, preventing the starting marks which come from turning the loom over by hand. A let-off release lever enables the weaver to take the tension off the warp for the overnight or week-end stop.

The new 2x1 shuttle-changer likewise requires no slowing down or stopping of the loom at time of transfer. The changing mechanism is electrical in so far as the indication for the change is concerned, but is mechanical with respect to the actual transferring of the shuttles. Suppose, for example, that the bobbin in one shuttle bares its ferrule as it is running toward the indicating or drop-box end of the lay. The feelers which contact this ferrule are not charged by the indicating mechanism until the other shuttle is half way back on its final (for the moment) pick. At this time a circuit is completed through the ferrule, operating a solenoid which makes a mechanical connection between a revolving cam and a lever. This cam, through the lever, raises the shuttle box on the magazine end of the lay to its high or transferring position, thereby offering a dummy or exit box to the incoming practically - e m p t y shuttle. The lever in the same movement also releases a shuttle from the correct cell of the magazine, the control for this cell being put in its path as a matter of loom routine every time the shuttle from this particular box is on the magazine end of the lay.

Indicative of the recent developments in yarn-producing equipment are three new pot spinning machines brought out in 1933. While the three machines differ from one another in detail, the outstanding feature of each is the rapid traverse which permits a proper build of cake at the higher spinning speeds now possible. For use on the new high-speed machines there has been developed a reinforced corrosion-resisting spinning pot designed for operating speeds of 7,200 to 10,000 r.p.m.

Five years ago the last period of expansion in the rayon yarn manufacturing industry came to a halt. In 1933 rayon consumption in this country set a new high record. Anticipating a still greater demand in the future, a number of yarn producers are taking steps to increase productive capacity. Plants will be enlarged, new machinery installed, many of the improvements in equipment announced in recent years utilized for the first time on a commercial scale. High spinning speeds, better quality of yarn, and lower operating costs will be obtained in the new units.

Rayon Codes

Rayon Weaving Code Proves Constructive

By PERCIVAL S. HOWE

President, National Rayon Weavers Association

THE cotton textile industry was quick to recognize in the National Recovery Act a signal opportunity for coping with the chronic and devastating condition of overproduction with which it has been faced for a decade. On the other hand, the rayon weaving industry is a relatively new and virile industry, with an expanding market for its products.

The code, though for somewhat different reasons, has proven thus far constructive and bids fair to provide the means for regulating production and distribution and for sustaining employment during 1934.

The extent to which the industry will derive full benefit from the code will depend in large measure upon the capacity of those responsible for its administration in determining between those factors which experience has proven, and judgment can forecast, as subject to cooperative control, and those factors influenced by underlying economic conditions, interference with which will undermine confidence and the prevailing spirit of cooperation.

COMPARED with the battles in which code-makers in some of the other divisions of the textile industry engaged, the tribulations of the city-fathers of both the rayon yarn and rayon weaving industries were just minor scuffles. All the trouble the yarn group had, consisted of determination on the part of two companies which produce acetate yarn exclusively, to administer their own trade practice provisions through an agency of their own creation. No objection to the labor provisions of the rayon yarn code developed.

The rayon weaving group had the unpleasant, but not critical, task of assuring the NRA that a rayon weaving industry really existed, in order to offset testimony to the contrary offered by silk groups at the hearing.

Increase in Yarn Plant Employment

The yarn code is just about as simple as a code can be. It takes care of the labor provisions—and that's about all. But apparently it does that job effectively. S. A. Salvage, chairman of the industry's committee which submitted the code, estimates elsewhere in these columns that the code has been responsible for an additional 10,000 workers. At the hearing on the code in Washington last July, Mr. Salvage estimated that it would be necessary for the industry to employ and train 3,500 additional employees. Not many industries have exceeded their hopes by such a wide margin.

At this writing, no decision has been rendered in the protest by the two acetate producers referred to above. All companies are observing the labor provisions of the code and, since the majority group itself has not established any trade practice provisions, both sides to the controversy are even.

In fact, a rather unique situation exists in that no Code Authority has been formally named as yet for the rayon yarn code. The acting committee has a secretary who collects statistics but otherwise there is no code administration as such. Undoubtedly one will be appointed eventually, and the yarn producers will have what amounts to a formal group, as contrasted to the lack of organization which persisted throughout the code-making days.

A sharp difference between this code and the codes of most textile industries lies in the fact that it has no limitation on machine hours. The explanation of this omission forms a part of the code itself: "This code is based upon the fact that an inherent characteristic of the manufacture of synthetic yarns is that production must of necessity be continuous—the chemical and textile departments being in balance; thus any limitation of the hours of machinery cannot economically apply to the rayon and synthetic yarn producing industry and still have the industry survive."

General Johnson gave the rayon industry a boost in his report to the President recommending the approval of the code. He said: "From a review of the records it appears that this industry, in contrast to most other manufacturing industries, has shown a remarkable resistance to the forces of the depression. . . . The remarkable growth in the consumption of rayon since the war is explained in no small degree by the trend of prices. The average price in the peak year of 1919 was approximately $4.77 per lb. (150 denier grade A), since which time prices have been reduced until the record low price of 55c. per lb. for the same grade was reached in April of 1933. Since that time prices have been increased to 65c. per lb. which is approximately 47½% below the average 1929 level."

How to insure a continuing price policy which will encourage the development of maximum consumption of rayon is undoubtedly the major problem facing the industry. A three-point program is suggested to us by a close student of this particular field of manufacture. He believes that the main clauses of a rayon and synthetic yarn code should include (1) no public price agreements; (2) the elimination of all rebates for volume; (3) the elimination of all rebates for advertising. His

U. S. and World Rayon Yarn Production from 1920 to 1933

	United States	World
1920	9,000,000	52,120,000
1921	18,000,000	64,570,000
1922	26,000,000	78,100,000
1923	35,000,000	104,500,000
1924	38,750,000	140,800,000
1925	52,200,000	189,200,000
1926	62,575,000	218,090,000
1927	75,050,000	288,385,000
1928	97,700,000	359,775,000
1929	123,000,000	440,740,000
1930	119,000,000	410,225,000
1931	144,350,000	470,790,000
1932	134,800,000*	508,970,000
1933	207,600,000*	660,155,000

*From the *Textile Organon;* all other figures are TEXTILE WORLD'S. Those on world output are from our Manchester (Eng.) correspondent and have been revised. In adjoining table, U. S. figures are from *Textile Organon,* and all others from TEXTILE WORLD'S Manchester (Eng.) correspondent.

first point, incidentally, is directed at price-fixing and not at the so-called open price or price-registration plans, because he goes on to say that he would insist, "of course," upon each manufacturer giving the Code Authority at least once a month, or at the time the price change is made, a record of the price at which the yarn was to be sold. He adds that these prices need not necessarily be published, but the reporting of them would provide the means of establishing that no customer was discriminated against during the period the price is in effect.

"To the above three points," he comments, "could be added the general Golden Rules applicable to all business, but these specific principles would in my estimation allow the industry to develop by its own momentum on a fair competitive basis in the 'Battle of the Textile Fibers,' allowing the individual firm to obtain the proper reward for its ability, when required to give the public the best product for the least money. With these clauses in effect, chiseling would be at an end."

Rayon Weavers Organize

Code-making not only gave rayon weavers a chance to prove publicly that theirs is a distinct industry but also was the impelling force which lead to formal organization. The National Rayon Weavers Association is very definitely a child of the NRA.

The silk-rayon controversy at the hearing on the rayon weaving code was an interesting one. A spokesman for the silk group protested against the provision in the code for the compilation of statistics by the rayon weavers' group. He stated that the Silk Association had been doing that for years. The deputy administrator in charge asked if it was fair to require an association (the National Rayon Weavers Association), representing 70% of an industry, to send its statistics to a competing industry. It was then that the silk spokesman stated he didn't think there was a rayon weaving industry as such; "it shifts as fashion swings."

The argument was settled by a compromise permitting "any manufacturer operating silk looms known to the trade as a silk manufacturer and so listed in trade directories" to elect not to be bound by any of the provisions of the rayon weaving code with respect to its synthetic fiber production, providing notice of such decision was filed within a specified length of time.

The cotton textile code, with its well-known maternal instinct, gathered the rayon weaving code under its wing. The latter became effective through a Presidential order modifying and amending the cotton code. The rayon weavers' organization became one of the groups responsible for the appointment of administering committees. This arrangement undoubtedly was of benefit to both groups since it tended to avert duplication and conflict of effort.

The scope of this new member of the cotton code is defined as "the manufacture of woven rayon fabrics, 18 in. or more in width, the warp of which is primarily rayon or other synthetic fiber yarn, whether finished or unfinished."

One of the interesting by-products of the organization of the rayon weavers has been the formulation of a plan to check over-buying by their customers. As stated previously in these columns, the plan is to have all manufacturers report daily all orders received, which figures would be compiled by a central bureau of recognized integrity. It would thus be possible, it is explained, for any member of the group at any time to get figures as to a customer's total liabilities and total orders he has placed for future delivery, as compared with his capital.

In their code as originally submitted to the NRA, the rayon weavers included a provision for the limitation of installation of additional equipment, practically identical with the clause in the cotton code. Since its absorption into the latter, it is of course governed by that provision.

Summing up, it is evident that the code pressure represented a singular opportunity for the rayon weavers' group since it resulted in their effective organization as a separate and virile agency.

Estimated Production of Rayon Yarn by Countries and Processes—1933

(in thousandths of lb.)

Country	*Viscose*	*Acetate*	*Cubra and Nitro*	*Total*
Austria	670	...	....	670
Belgium	8,385	540	....	8,925
Brazil	1,160	330	....	1,490
Britain	63,535	18,660	2,105	84,300
Canada	6,300	1,520	....	7,820
Czechoslovakia	5,400	....	....	5,400
France	49,000	4,000	....	53,000
Germany	63,050	3,250	9,700	76,000
Holland	22,000	....	....	22,000
Italy	77,405	1,835	1,750	80,990
Japan	87,425	....	1,740	89,165
Poland	5,450	....	....	5,450
Spain	4,930	....	....	4,930
Sweden	415	....	....	415
Switzerland	11,720	280	....	12,000
United States	158,600	35,900	13,100	207,600
Total	565,445	66,315	28,395	660,155

What Rayon Yarn Code Did to Employment and Wages

By S. A. SALVAGE
Chairman of Committee Representing the Industry, Which Submitted the Code

I ESTIMATE that the rayon yarn industry was employing approximately 41,000 workers prior to the signing of the code. To conform with the code, it was necessary for the industry to take on an average of about 24½% additional employees—or in other words the code is responsible for an additional 10,000 workers in the industry. Further than this, the code is responsible for raising wages between 20 and 30%. Such have been the tangible results of the code thus far.

• RAYON MILL KINKS •

Cut-Rayon on Cotton Machinery

One of the most troublesome features of processing cut-rayon on cotton machinery is in the sticking of the stock on the lap-bar at the picker. To overcome this, fit a thin pipe snugly over the lap-bar. Use pipe stock the same diameter as the lap-bar, and reduce the size of the lap-bar just enough to permit the pipe to fit over the lap-bar. Instead of pulling out the lap-bar, a very tight lap will merely pull the bar out of the pipe. Of course, the pipe stays in the lap until the lap runs out at card, and the pipe is used over and over again. ARTHUR OUIMET.

Oiling Rayon

The process of oiling rayon prior to winding usually is a wasteful, messy operation. The following method, however, will

be found much more efficient than those in general use. Open a case of rayon and stand up the bundles in the case. If 6% of oil is desired, 0.6 lb. of oil is necessary to the bundle. Cut down a tin can to hold 0.4 lb. of oil; and then using this as a measure, dump a canful in the opened end of each vertical bundle. After the bundles have stood for 2 hr., turn them end for end and oil again. Two 0.4-lb. oilings allow 0.6 lb. of oil to be absorbed by the yarn and 0.2 lb. to be absorbed by the paper. When this method is followed, the yarn is oiled uniformly; the skeins wind well as they are not handled, and the yarn can be given to the winders without weighing.

Rayon Take-Up Formula

A table for showing yardage, elongation, and tensile strength of rayon yarns of various deniers would be invaluable to the throwster. So far as the writer is aware there has been no table of this character released for general use, although he understands that certain throwsters are developing or have developed such tables to meet their own needs. Strength and elongation vary among the different types and brands of synthetic-fiber yarns, and delustered yarns lose more strength and elongation in throwing than do bright yarns. These factors, and also the tensions in throwing, affect the take-up or contraction and hence the yardage. However, the following formula can be used to calculate contraction:

$$\frac{\text{Turns per inch} \times 51}{\sqrt{\text{Yards per pound}}} = \text{percentage contraction}$$

For example, if we apply this formula to a 100-denier, 40 filament, 50/55-turn rayon crepe, and assume an average twist of 52 and a yardage per pound of 45,000, we find:

$$\frac{52 \times 51}{212} = 12.5\% \text{ contraction}$$

Then the yardage per pound of the twisted yarn may be determined as follows:

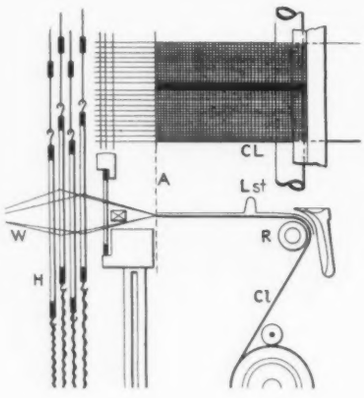
$$45{,}000 \times .875 = 39{,}400 \text{ yd. per lb.}$$

The constant 51 has been found to give accurate results when certain yarns have been checked on the sizing reel or when calculations have been made from the weight of the finished cloth. Nevertheless, one throwster has convinced himself that the correct take-up for the yarn mentioned above is 11.5%, rather than 12.5%. Further research is needed on this subject.

The strength of the thrown yarn, if viscose, should average not lower than 1.2 grams per denier.

Let-off Measure for Looms

Starting marks often result from filling breaks, warp breaks, double ends, etc.; and they occur many times a day at almost every loom. If left in the cloth, they will spoil the piece. Therefore it is necessary to remove the defective picks and regulate the tightness of the filling. However, when weaving is again started, one is not certain that the starting mark will be avoided. A let-off measure which enables a considerable saving in time has been devised in one mill. Each weaver has been furnished with one of the measures and instructed in its application. The way in which the device is used is shown in the accompanying illustration. The let-off measure *Lst* is made of steel, and is of exactly the length to reach from the cloth roll *R* to the weaving line *A*. Before the loom is started, the weaver places the



measure on the cloth, lets off the cloth toward the harness, with the regulating handwheel draws the cloth slowly back until the line *A* corresponds with the end of the measure. If desired, the let-off stick can be made adjustable to different lengths. B. G.

Streaks in Cotton-Rayon Fabric

A mill wove on contract a considerable amount of cloth with a 15s cotton crepe warp and 150-denier, 40-filament, 2½-turn rayon filling. The fabric was shipped to a finisher, and was allowed to lie about for two weeks before it was dyed and finished. After the goods were finished, they were found to have streaks across the filling. These streaks resembled shiners, but did not follow the filling threads regularly, indicating that the fault was not in the filling. The cloth had been put up in folds; and it developed that on a damp day preceding the dyeing the crepe warp had contracted at the folds. This contraction displaced the filling, causing the streaks. The mill now puts up the cloth on rolls, and no further trouble of this nature has been experienced.

Improving Cone-Winding Conditions

Two points which have a great deal to do with the uniformity of cones produced on the No. 50 Universal winder are often overlooked in mills which are familiar with all other parts of the machine. Many of these machines are equipped with gainer belts instead of gear-gain mechanism. Where belts are used, it is important that all belts be of the same thickness if one is to get uniform cones. If, on the same machine, one spindle has a thick belt and another one a thin belt, the results of the winding on those two spindles will not be alike. Also important is the balancing of pressure weights. These weights are cast, and there may be a slight difference in weight from one spindle to another. Mills that want absolute uniformity should weigh these weights to make sure that they are all alike. On new machines care is taken to have the weights of uniform size and weight, but with second-hand machinery there is far less certainty that this will be true.

A mill using No. 50 and No. 60 Universal winders experienced considerable difficulty in that the paper cones frequently fell off the arbors. Finally it was discovered that failure to use a paper cone with the correct taper was the source of the trouble. There are three tapers of cones which are so near alike that it is easy for a mill to make a mistake and use the wrong cone on the metal spindle arbor. These tapers are 8° 30′, 9° 15′, and 9° 36′. Many mills, particularly those using second-hand machinery, have two tapers of metal arbors, but are trying to use one style of cone. These mills will improve their winding conditions if they will check the taper of their arbors and then use paper cones with the proper taper. R. L. CHISHOLM.

Realignment Achieved

TO CLARIFY WORK IN KNIT GOODS DIVISIONS

APPRAISAL of the 1934 outlook for the knit goods industry in terms of 1933 accomplishment leads us to some rather unexpected conclusions. Important as was the progress made individually by the three branches—hosiery, underwear and outerwear—this was no more significant than the clarification effected in the relationship of the branches to each other.

The dream of a unified knit goods industry is still far from realization in view of the diverse interests of the respective branches, but certainly the industry achieved much progress through its reorganization work of 1933. The results of this reorganization are that the three major associations now definitely identify themselves, by name and by coverage, with specific branches: Hosiery is represented by The National Association of Hosiery Manufacturers, which has eliminated underwear from its scope; underwear is represented by the Underwear Institute, formerly the Associated Knit Underwear Manufacturers of America (and for a short time known as the American Knitwear Association); outerwear retains its original representation in the National Knitted Outerwear Association, of which August Egerer, of S. Augstein & Co., is now president. The new associational set-up helps greatly to reduce the over-lapping.

While the problems and accomplishments of the divisions necessarily vary greatly, the opening of the new year found them sharing three main points of progress: First, improved financial position; second, maintenance of a more adequate ratio between output and sales; and third, increased associational strength helping toward development of sound policies for the recovery period. In reviewing the branches separately, the picture that presents itself offers much encouragement for 1934.

Hosiery

The financial reports of hosiery mills indicate a consistent and, in instances, a most decisive improvement. One firm which made about $75,000 profit in the year ending Aug. 31, 1932, reported $175,000 profit the following year, a net gain of about 150%. Another increased a 1932 profit of $15,924 to $89,018 in 1933. For most mills the real pick-up did not develop until mid-year of 1933, and therefore half-year reports are an inadequate index of the year as a whole. This is shown in the report of one major company which registered a $200,000 loss in the first half of 1933 against a moderate profit in the same period of the preceding year.

Figures on production and shipments compiled by the Department of Commerce point to a paralleling of output with sales. During the first 11 months of 1933, production totaled about 52,612,000 doz. pairs, against net shipments of 52,217,000 doz. pairs. The 1933 production figure represented a substantial drop from 1932 when output for a similar period reached 56,582,000 doz. pairs. Considering that the production total for last year does not cover the five-week period of 40% curtailment ordered in December, it is clear that the hosiery industry is in healthier stock position than for some time.

Apart from the code-adjustment problem which is outside the compass of this article, the hosiery manufacturer found himself occupied with three major issues during 1933—prices, labor dissension, and merchandising. These aspects reacted vitally, not only upon each other but upon the year's business as a whole. The up-and-down antics of hosiery prices may be exemplified in the behavior of 4-thread 42-gage full-fashioned; this line sold at $4.00 per doz. in January, 1933, rose to a nominal figure of $7.25 in September and then, after declining to $6.50 in November sank further to its January, 1934, level of $5.75. This indicates why price uncertainty was the rule rather than the exception during the last year.

With respect to labor, the most important development of 1933 was the perfection of Federal machinery for the adjustment of disputes, and the clarification of the government's position as an intermediary in strikes. This found expression on two occasions in the hosiery industry: First, in June, 1933, when Secretary of Labor Perkins intervened to avert a strike which the Federation of Full-Fashioned Hosiery Workers had ordered in Philadelphia, with the aim of strengthening its position for NRA negotiations; and again in August when the National Labor Board effected the cancellation of a general hosiery strike which had been called for Aug. 31.

Among the many labor conflicts of the year, two main developments are notable: Beginning in March, 1933, attempts were made by the unionized mills, through the Full-Fashioned Hosiery Manufacturers of America, to write a wage reduction into their agreement with the hosiery federation. This question continued through the year attended by much negotiation, until finally the National Labor Board settled the matter in December, by ordering a 5% wage increase retroactive to Nov. 15. Efforts of the Hosiery Federation to organize the non-union mills in the Reading, Pa., district resulted in a strike that reduced the country's full-fashioned output by about 30%. The difficulty was finally settled by the National Labor Board which ruled that the Reading mills must make written agreements with the union.

It was inevitable that the vexing labor situation should have had an adverse reaction on the industry's market position. Yet, thanks to numerous helpful influences, the merchandising picture for 1933 was a bright one. The advent of non-run hosiery stimulated demand in the lean days of the first quarter and popular interest in this innovation had no sooner begun to wane than several other features were introduced to maintain buying interest. The Lastex welt was among the improvements which helped to stimulate demand. With the mid-summer price rise, hosiery merchandising underwent a change of such significance as to have an important bearing on 1934 plans. Full-fashioned hosiery disappeared very largely from the 50c. class, and resumed its time-honored position in the medium-price and quality fields. This resulted in a decisive increase in demand for seamless, which gain at times reached boom proportions. Whether the trend will continue through the current year will, of course, depend on whether the price differential between seamless and full-fashioned is maintained. At present writing merchandising interest centers on the new "ringless" hosiery which various manufacturers are offering and which may be a major factor in the 1934 market.

With the aim of meeting the resistance incident to higher prices, hosiery mills are increasing their promotional effort in many ways, notably in distinctive packaging. Novel types of packages are understood to have helped sales considerably during recent months.

Underwear

Reduced losses by mills that had suffered heavy reverses, and a moderately improved profit position among those remaining in the black—such might be said to reflect the financial progress of the underwear industry during 1933. The feat of one large firm in reducing losses from $750,000 in the first half of 1932 to $250,000 in the same period of 1933 was indicative, though the position of underwear mills for the year as a whole improved considerably more than is indicated in this one instance.

The strong position of the ribbed underwear group is becoming a tradition; assuredly it stands out as an example to other textile divisions. Throughout the depression this group has held production to a close tally with sales, and it was natural enough, therefore, that these mills were able to show a healthy resistance during the worst months of 1933. The same firm attitude marked their position on prices. When fall lines opened in February, 1933, prices were 5% below 1932 levels. Numerous mills withdrew their lines shortly thereafter and by the end of March all lines were withdrawn. Ribbed underwear lines were reopened in May, but orders were taken "at value" only, and it was not until September that the industry formally announced prices. The quotations then published were nearly double the levels of February, 1933.

The benefits of this policy were numerous. The ribbed underwear mills escaped much of the price chiseling which spread through the textile industry during the early part of 1933. At the opening of the 1934 fall lines in January of this year, prices averaged 10% below the September, 1933, levels, however, in light of the moderate stocks and the determination to produce only what they can sell, protracted weakness seems unlikely.

It is significant, though, considering the above, scarcely surprising, that the underwear industry is one of the few among the larger textile divisions which has not found it necessary lately to undertake general curtailment.

An interesting feature of 1933 and one that promises to have important bearing on the underwear industry's position this year, is the tendency toward concentrating the manufacture of tubular knit rayon underwear fabric in fewer hands. Two important rayon yarn producing companies are now engaged in fabric manufacture, and one substantially increased its knitting equipment last year. In August, 1933, tubular fabric manufacturers formed the Rayon Circular Knit Fabric Manufacturers Association, which body later laid the basis for modified affiliation with the Underwear Institute.

Outerwear

Evidence of new blood and a real determination to put itself on a profit-making basis are clearly visible in the outerwear industry. These mills follow the trend of knitters generally in moving from the red to the black column. Not all have done as well as the internationally known bathing-suit company which reported for the year ending Aug. 31, 1933, a net profit of $105,434 against a net loss of $118,192 in 1932—a 200% improvement—but there is consistent progress in this direction.

The outerwear industry's record for 1933 is impressive in many respects. Under the auspices of the National Knitted Outerwear Association, the first Knitwear Industrial Exposition was held in New York in February. With all the apparent odds against such a project, and the bank holiday spreading disquiet everywhere, the industry nevertheless made the affair so successful that it was repeated this year.

Price position of outerwear lines was scarcely encouraging when 1933 opened, levels being 15% to 25% below 1932. Business improvement in mid-year brought strength, however, and levels rose steadily. The opening of the 1934 outerwear lines last November found prices above those of the preceding season; in some cases the advance represented a 60% gain.

Two labor problems occupied attention during the year. A strike which extended through the fall months seriously impaired outerwear business in the New York district by impeding production. The moot issue of the "company union" was the basis of a controversy between Cleveland outerwear mills and the United Textile Workers Union. This dispute was settled Feb. 1, 1934, when the National Labor Board held that the union's charge of NRA code violation by the manufacturers was unfounded. The National Board recommended that the Cleveland Regional Board vacate its decision ordering new union elections at the mills.

Knitting Chronology *for* 1933

JANUARY — Reorganization and rechristening of Associated Knit Underwear Manufacturers of America initiated. Headquarters moved from Utica, N. Y., to Belton, S. C. New name of American Knitwear Manufacturers' Association adopted. Happily this was later changed to Underwear Institute.

Recommended standard lengths for hosiery submitted to the industry. What with skirt lengths changing all the time, the standardization experts are somewhat groggy.

Swimsuit prices open the year at prices about 20% below 1932. Lastex numbers featured.

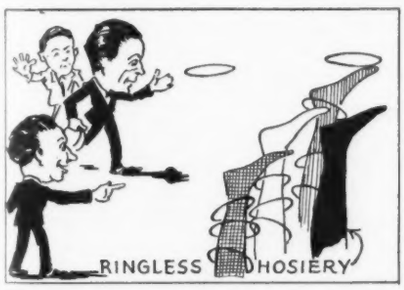
FEBRUARY—National Knitted Outerwear Association decides to make cost budgets available to members; data supplied by group of successful mills.

Heavyweight underwear lines opened; prices about 5% below previous year.

Timed to coincide with arrival of buyers from other centers, first Knitwear Industrial Exhibit held in New York together with convention of National Knitted Outerwear Association.

MARCH—Sweater manufacturers, despite avowed purpose of opening lines in February, still hold off because of buyer indifference.

Ideal budget for small mill presented



and discussed at meeting of Brooklyn manufacturers, under the auspices of National Knitted Outerwear Association.

American Federation of Full-Fashioned Hosiery Workers refuses emergency demand of employer group, Full-Fashioned Hosiery Manufacturers of America, that wages be reduced. Employers claim that agreement, which terminates Aug. 31, places them at disadvantage in competition with non-union mills.

APRIL—At a meeting in Philadelphia, National Association of Hosiery and Underwear Manufacturers wisely decides to drop "and Underwear" from title.

Single-head full-fashioned machine attracts crowd at Knitting Arts Exhibition.

Directors of National Association of Hosiery Manufacturers decide to set up divisional committees to aid in formulating code; the chairman of each committee being a member of the Hosiery Industry Board of Control.

Industry-wide surveys conducted by the American Knitwear Manufacturers Association and the National Knitted Outerwear Association to secure opinions and data for formulation of codes.

Devices developed for knitting "ringless" hosiery. Plan is to knit successive courses from three supply packages rather than one.

Knitted Sportswear Guild formed under auspices of National Knitted Outerwear Association to fight unfair practices, design piracy, etc.

JUNE—American Knitwear Manufacturers Association moves offices from Belton, S. C., to Washington.

Substantial agreement reached by National Association of Hosiery Manufacturers and American Federation of Full-Fashioned Hosiery Workers on wage and hour provisions of proposed code.

Hosiery cost manual issued by National Association of Hosiery Manufacturers. Unusual interest evidenced because of emphasis placed on cost of production by NRA.

Intervention of Secretary of Labor Perkins halts strike of non-union hosiery operatives in Philadelphia on June 22. Strike in Reading, however, shows signs of spreading. Question is union recognition.

Woven underwear division set up by American Knitwear Manufacturers Association.

JULY — Manufacturers of high-styled knitted sportswear, selling to the retail trade, set precedent when they cooperate in showing fall lines simultaneously.

Hosiery industry temporarily goes under wage and hour provisions of its code on July 26, pending final approval of entire code. Sliding scale minimum wages provided.

Tentative approval given to outerwear code pending hearing.

Underwear industry operates temporarily under cotton code by executive order.

Production of full-fashioned hosiery cut 30 to 40% by strike in Reading district.

August Egerer, of S. Augstein & Co., elected president of the National Knitted Outerwear Association succeeding Daniel Rheinauer.

AUGUST—Labor provisions of outerwear code put into effect pending hearing. National Labor Board makes its first move in any industry when it negotiates agreement between manufacturers and workers of Reading, where strike had been in progress six weeks, allowing workers to vote. Count favors union 10,296 to 3,786.

General full-fashioned hosiery strike, slated for Aug. 31, called off after intervention of National Labor Board.

SEPTEMBER — President places approval on hosiery code. Underwear code also goes through.

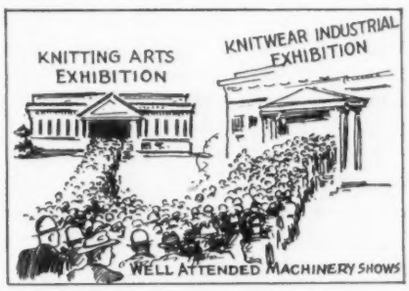
Troublesome footer issue threshed over at hearing in Washington. Code provision in dispute compels mills operating footers two shifts to reduce working hours to 35-hour shifts with pay same as for 40 hours.

Strike of workers in outerwear plants in vicinity of New York settled by wage increases of from 10 to 20% for a 37½-hour week.

OCTOBER—President grants further stay to manufacturers of underwear fabric who had protested against machine-hour limitation. Ruling applies mainly to knitters of circular rayon fabric who do no cutting.

Seamless hose manufacturers meet small boom. Credit is given to higher prices on full-fashioned caused by increased costs under NRA.

Bathing suit producers selling to wholesalers decide to shift seasonal



openings from Chicago to New York. Mid-November chosen as date.

NOVEMBER—Woolen Hosiery Institute formed, with Caleb Smith, of Seneca Knitting Mills Co., as president.

Standards of minimum measurements of men's woven underwear unanimously adopted at meeting of Underwear Institute. Standards were developed by Charles H. Hamlin as research associate of the Institute.

DECEMBER—Hosiery industry placed on schedule of two 8-hour shifts per day, 3-day week, for period of five weeks beginning Dec. 18. Code Authority initiates move and Washington approves. Protests simmer down as market shows better tone.

Southern Association of Hosiery Manufacturers established, with headquarters in Charlotte, N. C. Taylor R. Durham chosen as secretary.

Ringless Hosiery

AMONG TECHNICAL DEVELOPMENTS IN KNIT-GOODS FIELD

A CURSE somewhat like that which is supposed to hang over those who tamper with the tombs of the Egyptian kings seems to hang over those who tamper with the appearance of the full-fashioned stocking. The money thrown into the development of single-unit machines three years ago was lost largely because the resulting stocking did not have the correct heel and toe. The result is that the single-unit machines most recently offered preserve the accepted heel and toe, thereby sacrificing all saving in production costs, although eliminating the differences in shade between leg and foot —so helping to insure, rather than to destroy, the ideal of a perfect hose. The backers of non-run hosiery also suffered loss mainly because they attempted to alter the appearance of the stitch. Attempts to promote a stocking with the fashioning concealed likewise failed.

But this year's important development in full-fashioned hosiery knitting may escape this curse because, like the newer single-unit machines, it seeks only to insure the appearance desired. We refer to the three-carrier system for producing "ringless" hosiery. The patent situation regarding the three-carrier system has not cleared as yet, and certain technical difficulties mentioned on page 119 of the January, 1934, TEXTILE WORLD have not been satisfactorily overcome; but there is considerable ground for the opinion that ringless hosiery will eventually become the universal type. (It is predicted that the same principle will be applied to circular hosiery in the case of the less-complicated machines.) We shall leave further discussion of this subject to M. C. Miller, whose interesting review of full-fashioned developments concludes this article.

There were several interesting changes made during 1933 in the circular-hosiery field. The beginning of the year found the ability of wrap-hose machines to knit a color within a color (and beside a color) being developed generally. Later some of the earlier attachments were simplified and made less expensive. One of these, having a capacity of 36 wrap yarns and two wrapping points, can select jacks for either point through its spiral mechanism, placing three colors vertically if desired, two inclosed within the third. Another machine offers 24 wrap feeds with 19 independent steps, replacing the long- and short-butt jacks, which limited the selection of needles, by saw-tooth jacks with butts all of one length. The cam-drum selecting mechanism in this machine has been replaced by disks whose butts can be broken off for designing before the disks are placed in the machine. The order of the disks can then be changed quickly to give a large number of different effects.

Two feeds with double 12-step reverse plating at both and operative in the double sole were applied to circular hosiery machines, affording unusual designs and increasing production one-third in the case of half hose and one-half in the case of golf hose. The transferred-eyelet principle employed on underwear machinery was applied to the production of lace clocks on women's fine-gaged hosiery. Electric stop motions were placed on wrap machines, covering both body and wrap yarns, and on rib-to-toe machines—in both cases detecting loading of needles and broken latches.

In outerwear machinery the outstanding development was that of the circular links-and-links machine. It operates on a jacquard principle, employing perforated paper for control, and changes automatically to rib, jersey, or purl, in any order desired.

New in knit goods this winter was a women's tailored suit with a coat extending below the knee and a skirt and pull-down cap to match, the fabric appearing to have been woven until examined closely. A border is knitted on the bottom of the skirt or coat. The cap can have a border on the fold. An interesting combination of muffler and tie seen this season is 8 in. wide around the neck, 1 in. wide in front of the neck for tying four-in-hand, and 3 in. in the ends, which are 12 in. long.

Bathing suits have about the same amount of fabric this year as last. There has been some experimenting with lace tops and Lastex shoulder straps. Bathing-suit sales will be slow, as the stores have too many left over from last season.

It is evident that zipper sweaters are here to stay. The zipper blanket from Canada—with two slits for the arms, a tight neck, and a full-length zipper down the front—fills a need for winter sports. Kiddies' suits

with the extra thread run in but not knitted (giving better wear), and provided with the shawl collar, are popular. Quality cardigan jackets are on the way back to replace the present jumbo stitch.

In underwear the Swiss rib fabric, which is still in good production, was jumped from 14 to 20 rib, but the latter was found to be too high for economical production, and 18 rib will probably be the maximum from now on. A new 24-cut rib machine with 70-gage latch-needle cylinder, spring-needle dial, and ingenious sinker arrangement for measuring the stitch was developed for producing fine, 75-denier rayon fabric of unusual elasticity. The dial of this machine is gear-driven in order that dog marks may be avoided.

For the following review of full-fashioned hosiery we are indebted to M. C. Miller, well known authority and author of a series of articles on full-fashioned hosiery machines and their operation now appearing in regular issues of TEXTILE WORLD.

There has been no lack of new fabrics, new mechanisms, and other innovations in the full-fashioned industry during the last year, even though the industry is still in a very disturbed condition from an economic standpoint.

Mesh and Lace. The tendency to overproduce all-over mesh and lace and to offer impractical designs, so strong during 1932, has been corrected; and the present, more moderate demand for conservative, readily producible all-over mesh and lace stockings is being met satisfactorily. Mesh and lace welts have been produced in relatively conservative designs, and the output of this type of stocking has been readily absorbed.

Knee Elasticity. Some very desirable improvements have been made with the object of increasing the elasticity at the knee portion of the stocking. A hose of this type that has considerable merit is one in which pairs of alternate courses are formed of relatively loose loops, thereby increasing elasticity to some extent without greatly changing the appearance of the stocking.

Foot-and-Leg Hosiery. The developers of mechanism for knitting the foot and leg on one machine seem to be definitely getting away from the production of mongrel-heel hosiery. With the idea of such heels definitely out of the way, I believe we are entering a phase of worthwhile results in this endeavor. I do not want to give the impression that the ultimate machine of this type is now available, but one imported machine can definitely produce this type of stocking. Such production is at present possible only with the use of skilled operators and manual manipulation.

Anti-Run Fabric. There is still some demand for anti-run fabric, although one of the largest producers of this type of hosiery has discontinued making it. I do not believe this is due to the lack of consumer's demand for real anti-run hosiery, but rather to the undesirable features of existing types. The major objectionable feature, in my estimation, and one that must be eliminated from anti-run fabric, is the tendency for the threads, when pulled and then torn, to produce large holes. The tendency to resist thread-pulling must be at least as good as in normal fabric. The pattern of the fabric must of course be as near like plain fabric as possible, although I do not believe that an inconspicuous pattern would seriously affect at least a moderate demand for anti-run hosiery.

Single-Section Machines. During the past year, the industry has had an opportunity to gage the merits of the recently marketed single-section full-fashioned legging machine; and as far as I have been able to determine, machines of this type have not been found capable of producing at a cost as low as multi-section machines. This can be understood by considering the increased machine cost per section, the necessarily greater space required per section, with the relative increase in light, heat, and power, and the necessity of having the operator traverse considerably more ground than is at present necessary.

Multiple Carrier. An extremely noteworthy development now taking place is an attempt to eliminate the so prevalent variations in the transparency of full-fashioned fabric. This variation takes the form of horizontal light or dark shadow bands, caused primarily by the variation in yarn thickness, which in silk is inevitably due either to the actual variation in thickness of the filaments in the cocoon or to the breaking down of one or more of the filaments in the processing of the yarn. Certain defects of this type, while resembling shadow bands, are of course caused by machine inaccuracies or by variation in the tension or yarn drag; but at least 80% of the shadow bands are caused by irregularities in the yarn itself.

The attempts being made take the form of separately knitting a multiplicity of yarns in a fixed sequence. A specific mode is to use three leg cones and carriers per section, instead of the present single one. One of these three carriers lays a course of yarn while the other two remain idle, the next course is laid with one of the previously idle carriers, and the third course is laid by the third carrier. This procedure is repeated, commencing with the first carrier of the series laying its course in the opposite direction. The loops of yarn formed from any particular carrier are thus separated by two courses of loops formed from other carriers. In this manner areas of greater or lesser opacity from the normal are broken up and an averaging of the transparency is secured.

To practice this mode of yarn feeding necessarily requires that the operation and sequence of the carriers be automatically controlled. It also lessens the number of carriers available for producing the balance of the stocking and increases the necessity for careful and like winding of three times the number of yarn cones, and the careful evening of yarn drags and tensions. The fact that a different type of selvage is produced is not in itself detrimental, but the fact that two yarns are attached to the fabric in different courses during the narrowing makes uneven narrowing selvages more probable. There is more difficulty in causing the reinforcing carriers to plate properly with three carriers.

The original inventor of this system may prove to have been one Kaufman, who obtained a British Patent, No. 396,346, in October of this year and who probably has a United States patent pending.

Knitting Codes

HELP TO SOLIDIFY THE SEVERAL BRANCHES OF THE INDUSTRY

SPEAKING generally about the knitting industry—which admittedly is a rather silly thing to do—one of the greatest services which NRA has rendered it has been the clarification of lines of jurisdiction among the several branches, and the solidification of purpose and sentiment within each branch.

Again risking a generality, the knitting codes and their effects have received the support and enthusiasm, respectively, of the majority of manufacturers. That statement means more in this industry than it might in many others. Made up of many relatively small units, geographically scattered, making a wide variety of products and catering to a wide variety of customer-trades, knit goods manufacturers might not be expected to participate readily in coordinated enterprise. The fact that they did, speaks well for the virility of the leadership in the various branches.

This comment is made with due realization of the many problems which have stirred the industry both below and above the surface—and which still clamor for solution.

Hosiery

Since many of the problems just mentioned have affected the hosiery field, and have been given wide and continuing publicity, it is only fair to report here the consensus among manufacturers with whom we have talked or corresponded. The code has been well handled, they say—and they say it as if they mean it. It is also only fair to apportion the credit as they do. This intelligent handling of the code, they feel, reflects credit principally on Earl Constantine, managing director of the National Association of Hosiery Manufacturers and executive director of the Hosiery Code Authority. Many mill executives have given heavily of their time and thought to code making and administration but all acknowledge particularly the job done by Mr. Constantine.

Referring again to problems, Mr. Constantine, in a statement in another column, refers to production control as "still . . . the most important problem of the industry." Similarly when proposing a substitute provision on the now famous footer controversy, the Code Authority states: "The industry must realize that the proposed substitute still leaves the problem of production control substantially undealt with. This problem is the most important one in the industry, and the Code Authority will address itself to it promptly."

The reason for this emphasis becomes apparent when one recalls the various shades of opinion which developed, and were publicized, in connection with this footer controversy, and again with the general curtailment program put into effect for the five weeks ending Jan. 20. Here again, however, it is encouraging to note that, despite this difference of opinion, the attitude and method of the Authority in connection with the curtailment aroused widespread praise.

Not only is sane production control in sight for the industry, but the latter promises to gain many benefits through the regular statistical picture which is being made available. As one manufacturer expressed it to us: "I think we will have better thinking and planning because of it. For instance, hosiery manufacturers will think more carefully before they increase production by buying additional machinery, having as they will have the basic facts of the industry before them. There is no doubt that they have been going blindly in the past."

Sounder cost accounting methods, elimination of trade abuses—these and other potential results encourage the hosiery industry to administer its code vigorously.

Underwear

From the very beginning, the underwear industry, as a whole, has been ardently enthusiastic, first over the possibilities, and then over the results of their code. Operating at the start under the cotton textile code, by executive order, they finally secured the President's signature on their own code Sept. 18.

The main code worry from which they have suffered has been the question of jurisdiction, particularly in connection with controversy over the section which included within the scope of the code the manufacture of "any and all fabrics sold or used mainly for underwear purposes made on flat or warp or circular knitting machines."

Underwear Future Under Code Seems Definitely Bright

BY E. J. McMILLAN
Past-President, Underwear Institute

THE underwear and allied products manufacturing industry is decidedly optimistic over business prospects for 1934. Under our code, enthusiastically supported by the industry as a whole, fair competition is permitted with hours of operation and wages leveled, fair wages are being paid, efficiency of operatives is being raised, employment has been increased, standard of product is being improved, sub-standard merchandise is being properly marked to guarantee against deception, production and consumption are being better balanced, competitors are laying aside their petty differences and working shoulder to shoulder for the upbuilding of the industry. The industry is to be policed and prompt action taken against code violators. Unfair practices of long standing in the industry are being eliminated. The future of the industry under the code seems definitely bright.

Despite such controversies, however, the general effect of the NRA on the underwear industry has been to inject solidarity into its ranks.

Without question, the perfection and enforcement of the fair trade practice provisions represent the greatest single job ahead for this industry. This was reflected in the statement made by General Johnson in his report recommending approval of the code:

"The provisions for unfair trade practices contained in this code should, to a great degree, correct certain evils that have existed and that have developed in the industry. It is recommended that a careful study be made by the administrative body of the code as to the immediate results of the fair practice provisions of the code. Provisions for furthering the adoption of standards in the underwear industry will go a long way toward correcting some of the major evils now existing."

Outerwear

It is almost superfluous to add anything to the seven-point opinion on the operation of the knitted outerwear code offered by A. Egerer, president of the National Knitted Outerwear Association and printed in this column. We were particularly interested in his final statement: that ample leeway is still left for the exercise of individual judgment, and the reaping of return therefrom.

In the outerwear, as in the underwear, code, the question of jurisdiction has proved a knotty problem. A hearing was held late in January to determine whether makers of infants' and children's knit wear should come under the knitted outerwear code or whether the stay exempting them from that code should be made permanent, permitting them to have their own code.

Another difficult question is that of home work. To quote from General Johnson's report:

"Home work is a major problem in this industry, due to the wide variety of work done and the wide geographical distribution of the workers. Workers are located in both the metropolitan centers and in country districts in all sections of the United States. It is necessary to consider also the conflicting aspects of the problem, as represented by the possibility of low wages, long hours, child labor, and unsanitary working conditions on the one hand, and the crippled, needy, widowed mothers and difficulty of obtaining trained workers on the other hand. From the evidence submitted and from independent investigations it was evident that more time should be allowed for study of the problem. Accordingly, a home work committee has been provided for in the code to set equitable piece rates and to study the practicability of elimination of home work, insofar as possible."

The outerwear code contains a series of specific and important trade practice provisions. Through these, and through other phases of the code, constructive accomplishment is promised.

Outerwear Code Will Bring Order Out of Chaos

BY A. EGERER
President, National Knitted Outerwear Association

I WOULD summarize the effect of the code of fair competition for the knitted outerwear industry as follows:

1. It will bring order out of chaos, long existent in the industry.

2. It will teach the chiseler that chiseling does not pay, and will eventually eliminate that small but destructive element in the industry which refuses to cooperate.

3. It will reduce the mortality rate in the industry.

4. It will raise the wage level and cause increased and more permanent employment.

5. It will prove to buyer and seller that the economically right price for merchandise will be more beneficial to all, and gradually do away with the old "stupid" tactics of "squeezing" prices, and the making of unjust returns, thereby causing losses to producers, leading in turn to low wages and unemployment.

6. And finally it will lead to uniform cost accounting and proper pricing methods, raising the level of all members of the industry toward more ethical conduct for the common benefit of all.

7. BUT IT WILL NOT prevent the necessity of using in the future, as in the past, sound, good judgment, and it will not prevent the individual from reaping a greater financial return and enduring success by the exercise of creative ability and leadership.

Hosiery Code Will Make for Profitable Manufacturing

BY EARL CONSTANTINE
Executive Director, Hosiery Code Authority

THE hosiery industry benefited during the latter half of 1933 by the effect and operations of the hosiery code. While costs necessarily went up, the price structure, generally speaking, more than met these increases. The restriction of machine hours to 80 per week helped check production and this was further aided by the five weeks of 40% curtailment which started with Dec. 18. Finally—many bad practices which had developed in recent years were substantially ended by provisions in the code.

If the industry could show improvement between July and December 1933 in spite of the varied and frequently severe reorganization which it had experienced in the transition to code operations, it is only reasonable to expect that during the year 1934 it will show increased improvement.

With the institution of monthly reporting on production, shipments, stocks on hand, etc., and the distribution of a monthly composite report to all manufacturers, the industry will be able for the first time to guide itself intelligently. This year will undoubtedly see definite and sound steps taken in the direction of production control, which still remains the most important problem of the industry in spite of a reduction of machine hours from an average of 110 per week to 80.

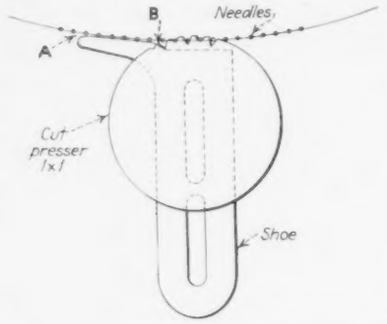
The year 1934 will see the industry costing its product by a uniform method. This method will assure prices which cover cost. Material progress will be made in all lines of fair trade practice, and standards for the construction of staple types of hosiey will probably be completed and put into effect generally. All of these will make for sound and profitable manufacturing.

In conclusion—this year will no doubt bring about material progress in solidifying the industry. New problems will arise which will require a spirit of cooperation. I am sure that the industry will rise to the occasion and make distinct headway.

• KNITTING KINKS •

Grinding Cut-Presser Shoes

In the ordinary method of running a shoe with a cut presser on spring-needle machines, the shoe is ground to fit the circumference of the particular size on which it is running. Some knitters find it advantageous to leave the shoe straight, simply easing off the corners at *A* and *B*,



as shown in the illustration. Rounding the corner slightly at *B* prevents the needles from snapping off the shoe and into the cuts or prints, as the case may be, of the cut presser.

Humidification in Knitting Mills

On a hot afternoon in August several years ago we were experiencing a great deal of trouble in knitting underwear fabrics. My fixer and I would adjust a machine, start it running, see that it was turning off fabric without a flaw, and leave it to work on another machine. No sooner had we done this, than the knitter on the machine we had just left would come to me with the news that he had had to stop it again. The thermometer registered 90. Humidity control at that time was unknown in a knitting mill, but I decided that what was needed was some dampness in the air. To make a long story short, I sent out for a watering can; filled it with water; and wet down the floor in the knitting alley, behind the machine, around the winders, and in every other spot that was not covered with something. Almost immediately conditions reverted to normal. This idea is not only serviceable under conditions of extreme dryness in mills not yet equipped with humidifying apparatus, but might also be of use as a temporary expedient when something goes wrong with the air-conditioning system.

H. D. Buck.

Device Enables Production of Single-Point Lace

Recently I was called to a mill which had a rush order for single-point lace. The mill had received orders to commence shipment at once or cancel the order. The accompanying illustrations show a device which I designed, and had made up during the day and installed that night. This enabled production to start the next morning.

Fig. 1 shows a knife *a* hinged loosely on a stud *b;* coil-spring *f* keeps the knife constantly in the direction of rod *g;* a flat spring *c* carries lug *d* which is to engage knife at point *e*. Fig. 2 shows the complete assembly; point bar *h*, point-bar rod *g*, and control spring *i* which keeps rod *g* to the left by constant pressure between bearing *j* and collar *p*. Bearing *k* supports collar *l* in the first position against knife *a* and in the second position when knife *a* is withdrawn against itself. In Fig. 2 the narrowing machine (not shown) has been lowered to its lowest point, carrying the whole assembly (except *c* and *o* which parts are stationary) down with it; and we find point *e* of the knife underneath lug *d;* the points in bar *h* in this position have taken alternate loops from the needles; and as the narrowing machine rises to the correct position for the side movement for transfer of loops, point *e* comes in contact with lug *d* which draws part *m* of knife *a* out from between the collar *l* and bearing *k;* this causes control spring *i* by its pressure on collar *p* to force point-bar-rod *g* over until collar *l*—which has been leaning on knife *a*—leans against bearing *k*, the correct distance necessary to move a transfer point from one needle to the next. The narrowing machine then dips to complete the transfer of loops. As the machine rises, the end of rod *g* comes in contact

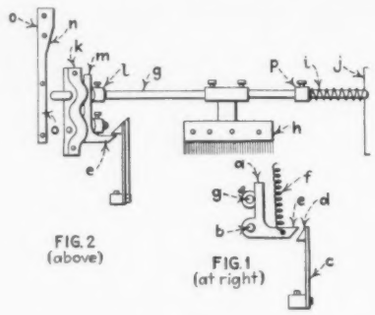


FIG. 2 (above)

FIG. 1 (at right)

with extension *n* on rigid cam *o;* rod *g* is forced to the right, allowing part *m* of the knife to slip in between collar *l* and bearing *k* and against rod *g* (as shown in Fig. 1) under the pressure of coil spring *f*.

It will be seen that as the narrowing machine rises to its full height, point *e* will be lowered considerably until it can pass lug *d;* this is of no consequence, however, as spring *f* at once brings the knife back to its position. As the machine dips for additional transferring, the end of rod *g* passes down slant *n*, allowing collar *l* to settle against knife *a* before the transfer points reach the sinkers; and the end of rod *g* is far enough away from slide *o* to allow rod *g* to move towards *o* without touching it when knife *a* is withdrawn.

Albert Gee.

Drying Hosiery in Bundles

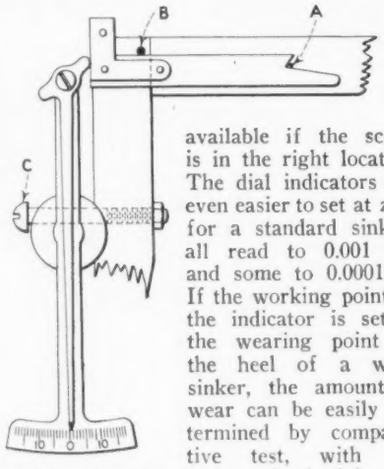
In a full-fashioned hosiery mill in Pennsylvania, it was formerly the practice to dry legs and footed legs by hanging them on ropes suspended from the ceiling or in the windows. The stockings were bundled in lots of 12 pairs, tied together at the tops. Drying depended on weather conditions and took from one to two or three days. Under the best of conditions there was a day's delay in sending stockings from the leggers to the footers and from the footers to the loopers. It was not always necessary to dry legs, but the delay in production on footed-legs caused the tie-up of at least one day's inventory. Drying was not uniform, resulting in some spoilage and delays at the footers and loopers; bad weather might cause a shortage of stock for the loopers, delaying orders; it was always possible, in spite of careful supervision, for 10 to 15 doz. pairs to hang too long on the ropes and oxidize, later to show up as poorly dyed stockings, resulting in seconds or re-runs for the dye plant.

Some time ago this mill installed a truck dryer in the gray goods planning department. The dryer is operated in spare moments by a helper in the planning department. Stockings are usually dried once as footed legs and sometimes as legs, depending on the need for this drying. They come to the dryer in bundles of 12 pairs, 5 bundles in a duck bag for protection are removed for drying and bagged for handling after drying. Every stocking is completely dried; neither toppers or loopers experience any trouble from moisture. Stockings are no longer exposed to oxidation and no spoilage has been noted. It is estimated that the installation of the dryer has enabled an annual saving of more than $475.

B. F. Miller.

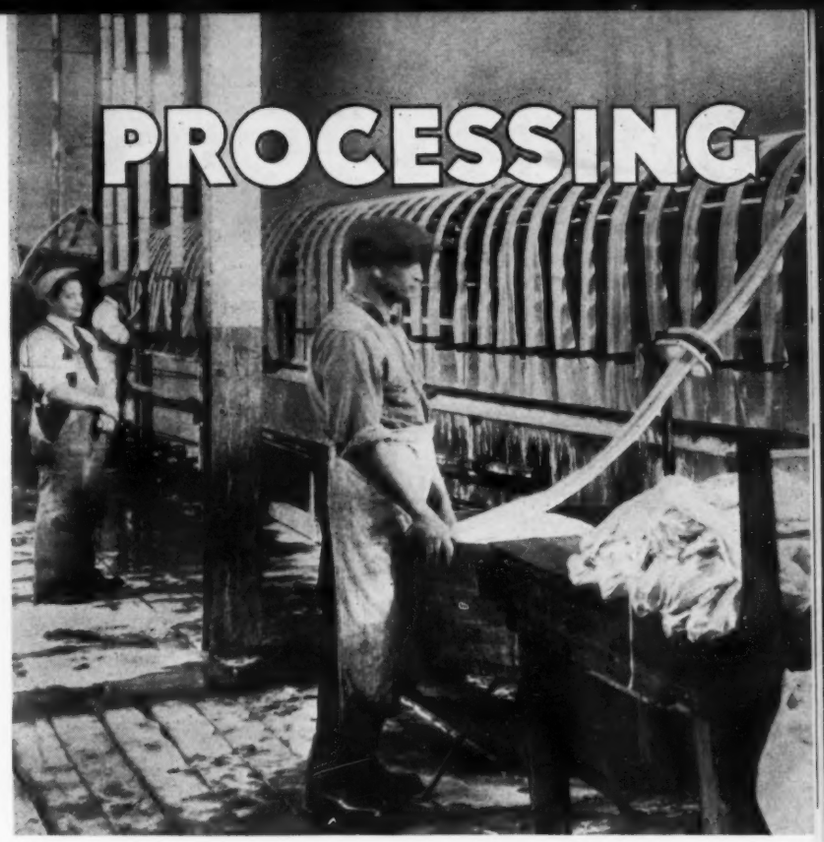
Improvised Sinker Gage

Some of our new sinkers made lines in the fabric; and since the measurements of the working length of full fashioned knitting machine sinkers defy ordinary methods, the sinker gage shown in the accompanying sketch was constructed on the corner of the wooden sinker box. In the illustration, *A* is the broken tip of a sinker firmly embedded in the edge of the box with the round end up; *B* is a finishing brad; and *C* is an ordinary machine screw (a wood screw will do just as well). One can use any type of test indicator which is



available if the screw is in the right location. The dial indicators are even easier to set at zero for a standard sinker; all read to 0.001 in., and some to 0.0001 in. If the working point of the indicator is set at the wearing point on the heel of a worn sinker, the amount of wear can be easily determined by comparative test, with the working length of a standard sinker of the same kind. For extensive use, a commercial indicator is on the market which is better adapted for rapid operation and affords a better angle of dial visibility for bench work. In an emergency, however, the home-made device gives a simple and accurate method for detecting errors.

Walter A. Simond.



Dyers and Finishers

DETERMINED TO END PROFITLESS PROCESSING

LIKE a ship caught in the doldrums, the textile processing industry drifted aimlessly into 1933. Month after month for two long years finishing activity had scarcely averaged 50% of capacity; profits were nil; apathy prevailed; spirit was lacking even to protest against almost intolerable conditions. The first quarter of the year passed; a breeze sprang up; courage returned; the decks began to be cleared for action. Rapidly the wind rose to tornadic intensity; the ship forged ahead at tremendous speed. Finishing activity in June was well over 100% capacity. What might have been a serious mutiny came to a peaceful end; the gale died down, the speed of the ship slackened; making scarcely any headway, but with promise of fairer winds ahead, the weatherbeaten craft floated on into 1934. Finishing activity for 1933 averaged approximately 65% of capacity.

It would be difficult to find a color black enough to paint a picture of the textile processing industry at the beginning of 1933. Given the color, only a madman would attempt the task. The picture finished, no one would care to view it. In the silk-finishing branch some 50 concerns had been taken over by creditors' committees or had gone out of business during the depression. In the cotton finishing branch scarcely a company had shown a profit for over a year. Trade organizations, where they existed, were steadily growing more and more impotent. A picture of the industry at the close of the year would be quite different. Here and there would be a bright spot. Losses in 1933 were far less than in 1932. It is doubtful if the industry as a whole made a profit; but some plants in each division can display a favorable balance sheet. Job dyers and finishers are well organized in three strong trade associations.

If nothing else had been accomplished in 1933, the steps taken to organize the various branches would alone make it a momentous year. The Institute of Dyers & Printers was incorporated in January to deal with non-technical problems of the silk and rayon dyeing and printing industry; the reorganization in May of the National Association of Finishers of Textile Fabrics put new life in the cotton finishers' organization; and the formation in June of the National Textile Processors Guild, Inc., served to coordinate a number of groups of yarn and raw stock dyers, etc. The power of these associations to prevent corrupt and unfair trade practice ie already being felt.

At the start of the year dyers, printers, and finishers—with a few rare exceptions—had not seen a profit for so long that they almost forgot what one looked like. This period of little or no profit was not due entirely to lack of work, but in large part was the result of ruthless competitive practices in which various branches of the industry indulged. In the silk and rayon finishing division, for example, net sales decreased from $106,000,000 in 1929 to $53,000,000 in 1932, although actual yardage processed increased during the period. In the cotton printing industry, again, production was over 75% of capacity both in 1931 and 1932, and averaged 83% for the first quarter of 1933. Nevertheless, in the late winter or early spring printing charges in general had dropped 40% from the peak prices of 1929. One printer then announced publicly that he would no longer do work below cost; others followed suit; and soon 80% of the industry was committed to an upward revision of prices. Unfortunately there seem to be a few non-conformists in every group; and as authority was then lacking to compel anybody to make a profit if he preferred to lose money, the good intentions of the majority were relegated to those regions said to be paved with such.

However the industry began to realize that as yet at least it is not supposed to function as a philanthropic agency. With this realization has come the determination to get printing prices up to a reasonable level. There are difficulties which still stand in the way; but they are not insuperable, and the efforts to obtain a general increase are already having some effect.

On the whole, the cotton dyers have been more successful than the printers in keeping finishing charges in line with costs. As processing costs increased, price adjustments were made; and within recent months few

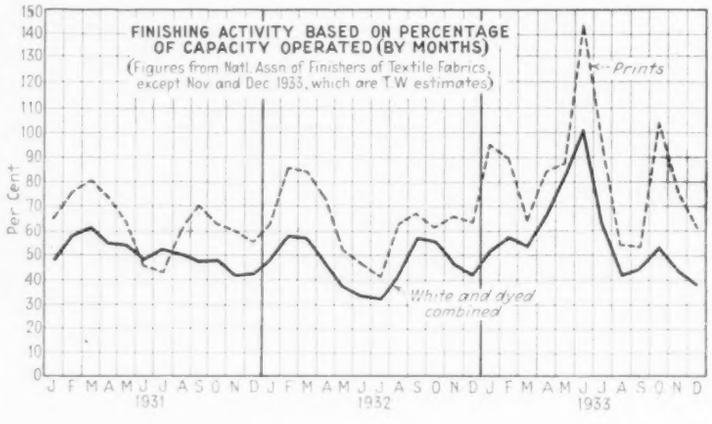
if any job dyers have accepted work which could not yield some profit. An open-price policy is being followed; and for the most part the job dyers have adopted a uniform practice in accepting orders and are offering no special inducements to their customers. Relations between the job finishers and the vertical set-ups are not yet entirely satisfactory, the job finisher and the converter feeling that in some cases the verticals are quoting lower prices for finished goods than are justified.

Their organization completed, silk and rayon dyers and printers also developed a renewed interest in profits. In September the Institute of Dyers & Printers organized a price information exchange and last month authorized an open price association. In the fall some acetate yarn producers considered the idea of buying or building finishing plants to serve their own customers. Little has been heard of these plans since the latter part of November when it was reported that the finishers would reduce the prices they were quoting for acetates.

Labor Relations

With the exception of the silk dyers' and printers' strike, there were no important labor complications in 1933. This strike, which affected some 15,000 workers and 97 plants in Paterson and vicinity, began on Sept. 5, when the radical National Textile Union called out the workers at the Weidmann plant of the United Piece Dye Works. On Sept. 8, eighteen dyehouses with 6,000 workers were at a standstill as a result of activities of the left-wing union. Meantime the United Textile Workers of America, affiliate of the American Federation of Labor, had entered the picture; and John Moffitt, conciliator of the U. S. Department of Labor, conferred with representatives of the Institute of Dyers & Printers and stated that he would deal only with this union. On Oct. 24 the strike ended with the acceptance by the Institute of Dyers & Printers, the Independent Dyers' & Printers' Association, and Local 1733 of the United Textile Workers union of an agreement providing for minimum wages of $23 a week for male employees and $16 a week for female employees, a maximum work-week of 40 hr., and recognition of the unions affiliated with the American Federation of Labor. The left-wing union was largely ignored during attempts at settlement and apparently has lost any prestige which it may have had when it instituted the strike.

While the strike was in progress, several of the cotton finishers attempted to process rayon and acetate fabrics of the types previously handled exclusively by the silk finishers. This caused a certain amount of apprehension on the part of some of the silk dyers and printers, who believed that this business might be permanently lost. However, the cotton finishers were not set up to process these materials and made no aggressive efforts to obtain the business. With the termination of the strike, fears of serious competition were allayed.



It is generally recognized the finishing industry suffers from an excess of plant and equipment. We have seen, for example, that in 1933 cotton finishing activity averaged 65% of plant capacity—and this in a year when gray mill production was slightly higher than the average for the last decade. In the face of this condition, there was a considerable amount of plant expansion last year—particularly of cotton finishing plants. Likewise, additional productive and auxiliary equipment was installed by many finishers for the purposes both of modernization and of securing proper balance of machinery.

As groups and as individuals the textile finishers by-and-large abhor publicity. Pressed on the point, they will admit that "It's the finish that sells the goods." But with rare exceptions, they make no real endeavor to sell the finish to the public, or their services to their customers. The industry has never had any conception of what merchandising really means. A few of the job finishers have made half-hearted attempts to advertise to the converters that they make prompt deliveries and produce satisfactory finishes. Some of the integrated companies have gone a little further in selling the finish.

Recently one of the larger silk and rayon dyeing and printing concerns has adopted a label which can be attached to garments made from fabrics finished by that company. The two real jobs of merchandising the finish are being done curiously enough by companies which are not engaged primarily in the finishing business.

Free-wheeling, knee-action, stream-lining. Everyone is familiar with these terms, looks for the innovations they symbolize when buying a new car. Fast colors, mothproofed fabrics, many of the so-called chemical finishes which have been developed in the last year or two, are just as important to the purchaser of a dress, summer suit, shower curtain, rug, or other textile as twin ignition is to the buyer of an automobile. But if these new finishes are to be capitalized to their fullest extent, individual processors must develop merchandising departments, trade associations must institute promotional campaigns.

In 1933 much has been accomplished; a traffic conference was organized by cotton finishers to bring all transportation problems under a single head, a court ruling was obtained that redyeing of piece goods is at the customers risk, design piracy was stamped out. Much more remains to be done; product research to fit the textile to its use is needed, modernization of equipment should be accelerated, standard cost methods must be adopted.

And thus we come to the close of the year. Due to a surplus of goods which was depressing the cotton industry, machinery activity—including that of dyeing and printing machines—was curtailed 25% in December. Then as the new year approached an upturn in business seemed imminent. Likewise, in the silk and rayon finishing branch the market took on an improved tone. Confidence returned, and with it revived the determination to end the profitless processing of textiles.

Processing Chronology *for* 1933

JANUARY—Hearing in Congress on bill providing protection against piracy of textile designs.

Corrosion-resisting dyeing equipment composed of asbestos base combined with synthetic resin made available in this country.

Institute of Dyers & Printers, a new organization of silk dyers and printers, incorporated to deal with industry's non-technical problems.

FEBRUARY—Committee appointed by Textile Section, New York Board of Trade, to set up definite standards for shrinkage of textile fabrics.

George L. Sawyer tenders resignation as secretary of the National Association of Finishers of Textile Fabrics.

Woolen and worsted skein dyers in Philadelphia and Brooklyn organize as Yarn Dyer's Association, Inc., with Stanley R. Stager as executive director.

MARCH — Figures released by U. S. Tariff Commission show domestic sales of coal tar dyes for 1931 to be 85,220,000 lb., valued at $38,564,000. TEXTILE WORLD estimates sales for 1932 at 76,000,000 lb.

Henry B. Thompson, of U. S. Finishing Co., states elimination of night running and adherence to 50-hr. week would go long way toward curing troubles of cotton printing industry.

APRIL — Flexible waterproof fabric produced by treating goods with synthetic resin compound makes debut.

Commercial production of anti-crease cotton and rayon fabrics by Tootal, Broadhurst & Lee process started in this country.

Hosiery finishing machine with twelve drying forms and giving semi-automatic operation introduced.

MAY—H. C. Copithorne, of Middlesex Bleachery, Dye & Printing Works, elected president of National Association of Textile Printing Colorists.

A.A.T.C.C. adopts standard dyeings for comparison in making washing and laundering tests on dyed wool.

Albert L. Scott, president Lockwood Greene Engineers, Inc., elected president of the National Association of Finishers of Textile Fabrics.

JUNE—Southern New England Finishers Traffic Conference, with headquarters in Providence, organized to bring all transportation problems of industry under one head.

National Textile Processors Guild, Inc., headed by Stanley R. Stager, organized to coordinate various divisions of industry, including raw stock and yarn dyers, job dyers and finishers of woolen and worsted knit goods, woven fabrics, etc.

Innovation in dyeing and finishing equipment is padder with four rolls and lateral sealing plates arranged to form an air-tight chamber for dye liquor or other solution.

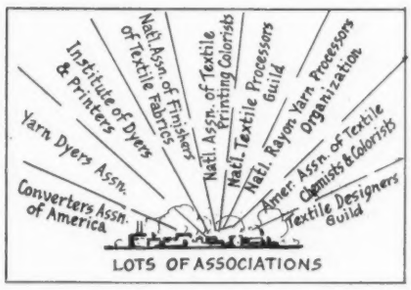
Leonard S. Little takes office as president of the United States Finishing Co., succeeding Henry B. Thompson, Sr., who becomes chairman of the board.

JULY—Institute of Dyers & Printers formulates tentative trade-practice code for silk and rayon dyeing and printing industry.

National Rayon Yarn Processors' Organization, Inc., organized with an initial membership of 34 firms. Royal Little, of Franklin Rayon Corp., elected president.

National Textile Processors' Guild files trade-practice code.

Cotton, silk and rayon finishing industries go under temporary codes by executive order.


Institute of Dyers & Printers
Natl. Assn. of Finishers of Textile Fabrics
Natl. Assn. of Textile Printing Colorists
Natl. Textile Processors Guild
Natl. Rayon Yarn Processors Organization
Amer. Assn. of Textile Chemists & Colorists
Textile Designers Guild
Yarn Dyers Assn.
Converters Assn. of America
LOTS OF ASSOCIATIONS

Executive committee of National Association of Finishers of Textile Fabrics recommends 35% increase in finishing charges on all fabrics.

AUGUST—Calco Chemical Co., Inc., purchases plant and business of E. C. Klipstein & Sons Co.

Dyers of wool raw stock and tops form Raw Stock Dyers Division of National Textile Processors' Guild, Inc.

Specialized finishers comprising Canvas Waterproofers' Association, Rug Chemical Processing Association, and Institute of Book Cloth and Impregnated Fabrics Manufacturers submit codes of fair competition.

Amalgamation of National Rayon Processors Association with National Textile Processors' Guild, Inc., effected.

Wages in dyeing and finishing industry increase from 37.1c. per hour

average on July 15 to 49.7c. per hour on Aug. 15. Hours of labor decrease from average of 49.5 to 36.3 per week.

SEPTEMBER—Annual convention of American Association of Textile Chemists & Colorists held in Chicago.

An increase in number of workers in finishing plants from 42,000 to 55,000 reported finishers' association.

Strike of workers at Weidmann Plant of United Piece Dye Works, Sept. 5, spreads rapidly, affecting 15,000 workers and 97 plants in Paterson area.

OCTOBER—Hearing in Washington on modification of cotton code to include finishing and mercerizing divisions.

Alexander Patterson, formerly secretary of Silk Dyers & Printers Association, placed in charge of statistical bureau of Institute of Dyers & Printers.

Silk dyers strike ends with acceptance by employer association and union of one-year agreement providing minimum wages of $23 a week for male employees and $16 for female.

NOVEMBER—Progress in fundamental and applied research discussed at annual meeting of United States Institute for Textile Research, New York.

Hearing held in Washington on trade-practice codes of rayon and silk dyeing and printing industry and of textile processing industry.

Silk and rayon converters organize as Converters Association of America, Inc., with Sol Moss as executive director.

Increase of 25% in employment in silk and rayon dyeing and printing industry since July 24 announced by Charles L. Auger, president Institute of Dyers & Printers.

Cluett, Peabody & Co. acquire preshrinking patents owned by Bradford Dyers Association, Ltd., and license latter company to operate under all preshrinking patents controlled by Cluett, Peabody & Co.

Modification of cotton code to include yarn mercerizing and cotton finishing industries made effective by executive order.

DECEMBER — Fourteenth Exposition of Chemical Industries held in New York with many new products of interest to textile men.

Improvements in fulling and need for further research discussed at annual meeting of Textile Division, A.S.M.E.

Dr. Robert E. Rose re-elected president of A.A.T.C.C. at annual meeting in New York.

New dryer developed is so designed that nothing but warm air touches the upper surface of the fabric.

Code for rayon and silk dyeing and printing industry approved by the President.

New Chemicals

CONTRIBUTE LARGELY TO ADVANCES IN TEXTILE PROCESSING

ONE need not have gray hair to remember when turkey red oil was turkey red oil. Aside from the water content, it all was pretty much the same grade; and that one grade had to serve for every purpose. Today we have highly sulphonated oils stable even to hard water and dilute acids; others—far less stable—which are valued by the silk throwster; between these a wide variety of compounds, each having definite characteristics. This range of sulphonated oils is but one example of the many types of compounds which have been made available in the last few years.

How quick the industry has been to adopt these new aids is demonstrated by the experience of a well-known manufacturer of textile chemicals. In December, 1932, this manufacturer announced a new series of products for use in scouring, dyeing, printing, finishing, and other operations. In December, 1933, he reported that three out of five orders which he was then receiving called for a compound in that series.

The ready acceptance of many of the products which have been introduced recently is definite proof of two things—that the products themselves have a real merit, and that the industry is far from standing still. Let us then glance briefly at a few of these materials which have contributed so largely to the technical progress made by the processing branches in 1933. Aside from dyestuffs, over 1,000 different chemicals are now used in textile processing; consequently we shall be able only to hit some of the highest of the high spots.

Passing over the sulphonated natural oils and fats already mentioned, we come naturally to the host of synthetic sulphonated products now at our disposal. These for the most part are long-chain compounds with jaw-breaking chemical names, such as the fatty acid esters of sulphonated aliphathic compounds, sodium isopropyl naphthalene sulphonate and the sodium salts of half sulphuric acid esters of fatty alcohols. Under various proprietary names much easier to say and to remember, these and other products are finding use as wetting agents, detergents, dye assistants, emulsifying agents, sizing and finishing compounds, etc.

Mineral oil products are finding increased application in textile processing and are now available in four general types: (1) straight mineral oils; (2) mineral oils blended with fixed oils; (3) water-miscible compounds of mineral oils with emulsifying agents; and (4) mineral-oil sulphonates. The first two classes are employed chiefly for lubricating raw stock and yarns; the water-miscible compounds are used for the same purposes and also in silk soaking, warp sizing, finishing of hosiery and other fabrics, etc.; the properties and uses of the mineral-oil sulphonates are similar to those of other types of sulphonated compounds considered above.

How well the old-timers among us remember the process for making fabrics water-repellent. No matter what the fabric (or its intended use) it got a run through aluminum acetate and then another through a solution of soap or paraffin softener. Waterproofing and water-repelling agents recently made available include latex compounds, synthetic resins, colloidal dispersions of paraffin combined with neutral aluminum acetate, pyroxylin, cellulose acetate, etc.

More and more the textile industry is turning to the use of organic solvents for use in soaking and degumming of silk; printing and dyeing; fiber lubrication; removal of tar, grease, and oil; and a dozen other applications. But space grows shorter; we can only list a few of the many new types of chemicals now at our service. There are, for example, mothproofing compounds, deodorants for textiles, wetting agents stable in strong caustic which permit mercerizing without a preliminary boil-off, improved printing gums for use with vat colors, and anti-felting agents. Among the very latest products to be developed are included a stripping agent for naphthol and vat dyes; a compound for fixing direct dyes to improve their fastness to water, cross-dyeing, perspiration, and wet rubbing; a scrooping agent for rayon, acetate, and cotton fabrics; and a new relubricant for treating stock-dyed cotton.

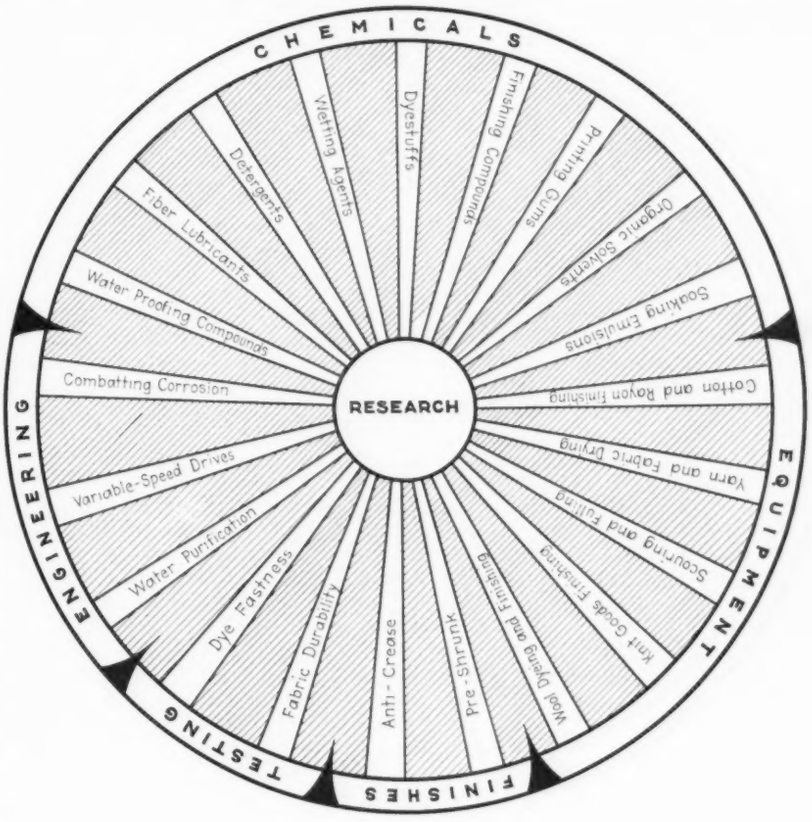
Most interesting perhaps of the new dyestuffs brought out last year is a range of colors for producing uniform shades on mixed fabrics. These dyestuffs, which are applied at a temperature of about 175° F. in a bath containing glauber salt, produce nearly identical shades on wool, silk, cotton, rayon, and cellulose acetate. When final shading is necessary, direct, acid, or acetate dyes may be employed as required. Also of importance is a line of instantly dispersible vat printing powders which can be stirred directly into the printing gum without pasting with water or other solvents. Because of their highly dispersed state, these powders give a homogeneous and non-specking paste with superior penetrating power.

Less phenomenal perhaps than the development of new chemicals, but important, nevertheless, have been the innovations in processing equipment, the advances in engineering practice, and the introduction of better and—in some instances—entirely new finishes. Of the score or more of new dyeing and finishing machines brought out in the last year, we can describe briefly only two or three which differ radically from the types available in the past.

One of these machines—a padder for processing either warps or fabrics—consists essentially of four squeeze rolls and lateral sealing plates so arranged as to form an air-tight chamber for the dye liquor or other solution; a spray printing attachment with which the padder is equipped permits the production of a wide variety of novelty effects. While the padder is suitable for apply-

ing all classes of dyestuffs, it is believed to be of particular advantage in the case of vat, sulphur, naphthol, Indigosol, and other colors which have a tendency to foam or to oxidize prematurely on exposure to air. Since replenishment of the dye liquor is automatic, and is proportional to the amount taken up by the material, tapering-off in color is avoided and dyestuffs of varying affinities can be employed without danger of uneven shades.

Another unique development is a hosiery drying machine with twelve drying forms mounted with their surfaces parallel and closely adjacent. In their drying position the forms are maintained in a vertical plane. When all forms are covered with stockings and are in the drying position, the operator by touching a foot control causes two forms to move down simultaneously for stripping. With a single stripping operation the operator removes both stockings; and with another touch of the control causes one of the two bare forms to return to the drying position while she pulls a stocking on the form remaining down. This charged form, upon returning to the drying position, automatically brings down the remaining form of the two previously stripped. The return of this latter form properly charged with a stocking simultaneously brings two more covered forms into position for stripping, whereupon the cycle is repeated.



A new dryer announced late in the year is so designed that nothing but air touches the upper face of the fabric as it passes through the machine on a continuous conveyor. The dryer enclosure is divided into two air chambers by an air diffuser which follows the contour of the conveyor path. Air passes from the high-pressure upper chamber through the diffuser and onto the fabric, next into the low-pressure chamber, and then to a reheater and back to the high-pressure chamber.

Other innovations in dyeing and finishing equipment include a machine which permits scouring, fulling, and dyeing of circular knit goods to be carried out consecutively in the one piece of equipment; an all-metal bleaching machine and dye kettle with convertible hump and bar reel having a variable-speed drive; improved cloth washers and fulling mills; several improved models of finishing machines for woven and knitted fabrics, and a creping machine for the treatment of rayon crepes.

Turning for a moment to advances in engineering practice, we find two fields in which there have been particularly noteworthy progress. These are in the further development and application of corrosion-resisting equipment and in the treatment of water for process work. Corrosion-resisting alloys, chemical stoneware, and the other better-known materials are finding new uses; and within the year dyeing equipment made of a new molded product produced by combining asbestos with a synthetic resin has made its appearance in this country. The most recent innovation in the treatment of water is the use of activated-carbon filters in conjunction with sand filters and zeolite softeners, the activated carbon being employed for removing the objectionable aromatic odor due to algae growths.

Finishers of cotton, rayon, and silk fabrics have been active in the development of new and better finishes. Easily the outstanding feature of the year in this connection is the commercial production in this country of anti-crease cotton and rayons by the Tootal, Broadhurst & Lee method. Preshrinking has continued to gain in importance, and considerable improvement has been made in the equipment used in the Sanforizing process. Typical of the new specialty finishes are a water and oil-proof finish obtained by treating the goods with a flexible synthetic resin compound; the so-called lacquer finish on rayon fabrics; book cloths impregnated (not coated) with pyroxylin solution; fireproofed fabrics for out-of-door use; and a light-weight, transparent, oiled silk produced by a new process.

In their efforts to improve the quality and durability of textiles, technicians have been active in developing improved methods and equipment for testing. Thus, the various sub-committees of the American Association of Textile Chemists & Colorists have continued their work on tests for fastness of dyed textiles, shrinkage of cotton piece goods, waterproofedness, etc. New testing equipment has been brought out for determining the stretch and strength of yarn; for measuring the stiffness, elasticity, thickness, compressibility and resilience of fabrics; and for making spectrophotometric color analyses.

In the accompanying illustration we have indicated the directions in which progress has been made during the last year or so. The hub of the wheel we have labeled "research." It is research that is responsible largely for the advances which have already taken place. It is the assurance that this research will be continued and extended which gives promise of even faster progress in the future.

Processing Codes

PROVIDE SOUND BASIS FOR FIRST CONCERTED MOVE FORWARD

OUT of both personal and editorial experience in the textile finishing industry extending over more than a score of years, we feel justified in stating that this industry, for the first time during our acquaintance with it, is now in a position to move forward by means of definite planning. Prior to this time, it has been forced to be satisfied with an opportunistic attitude. Mostly, it had to take what came along—and like it.

Furthermore, we feel justified in saying that this change has been the result of a combination of direct and indirect effects of code-making. Probably no better proof of this statement can be found than the fact that, in attempting to summarize in this article the influence of the NRA codes upon the processing industry, we can divide our story into three parts, relating to three distinct branches of the industry which in turn are covered by three distinct codes. Such lines of demarcation were non-existent prior to 1933.

Textile Finishers in Cotton Code

The first group is that represented by the National Association of Finishers of Textile Fabrics, and included under the cotton code, first, under a temporary order, and later under a permanent modification order signed by the President, Nov. 8. The scope of this group is referred to in the amendment as the finishing of fabrics "whether woven of cotton or rayon or other synthetic fiber or of a mixture of any of these fibers with any other fibers, provided that such finishing operations are carried on by (a) concerns engaged in the weaving of cotton and/or rayon or other synthetic fiber; (b) concerns engaged solely in finishing cotton woven fabrics; (c) concerns primarily equipped for and primarily engaged in finishing cotton woven fabrics who may also be engaged in finishing rayon and/or other synthetic fiber fabrics."

The inclusion of this group in the cotton textile code was an extremely sound move—and this should be demonstrated with increasing force in the future. All arguments were in favor of such a consolidation. General Johnson summed up these arguments when he stated:

"Consideration of the problems led to the conclusion that the same line of reasoning which had resulted in the consolidation of cotton and rayon weaving indicated that the cotton and rayon finishing operations should not be segregated from the fundamental cotton and rayon weaving part of the industry. Mills weaving cotton and rayon, or cotton alone, and finishing their own products are so numerous, and their finishing operations so closely interwoven with the other operations of these plants, that to attempt to disentangle and cut off those various operations in the same plant and to place them under the authority of separate and divergent codes would be impracticable. The finishing operations in these mills were already being conducted under the cotton textile code and the logical course seemed to all to be to then extend the operations of the consolidated cotton and rayon code to the cotton and rayon finishing operations of the job and corporation finishers as well as the mill finishers."

Recently, another step has been taken which, in the writer's opinion, still further clears up what has been a disturbed situation. The approval of the supplementary code of fair competiton for the cotton converting code, as part of the cotton textile code, brings under the master code still another vital link in the finished goods industry.

Although up-to-date statistics on the effectiveness of the code in the cotton and rayon finishing industry are not available, figures presented at the hearing on the code give an indication of the results. It was developed that the labor provisions meant an increase in number of employees from about 42,000 to 55,000, and an increase in weekly payrolls from about $750,000 to $1,000,000. There was also presented a comparison of average hourly minimum wage of a group of representative plants in 1926, in pre-code 1933, and in post-code 1933. The three figures were 27.4c., 23.1c., and 35.6c.

One of the most drastic steps taken as a result of self-government in this industry was the 25% curtailment program entered into in December. This was applied to all groups covered by the cotton textile code, and consequently affected all productive machinery in the finishing plants. In addition, an extension of this program to apply to printing machines only, was requested and secured for the month of January.

This question of curtailment as a policy is controversial in all divisions of the textile industry, but is especially loaded in the finishing end. Job finishers, in

Sound Progress Can Be Made Under Code

BY CHARLES L. AUGER

Past-President, Institute of Dyers and Printers

THE code of fair competition for the rayon and silk dyeing and printing industries is assisting us in an encouraging degree to bring about fair practice and consideration for the welfare of all.

We believe that sound progress can be made and better conditions accomplished in our business through faithful adherence to code provisions. The dyeing and printing industry has entered into operations under its code in the right spirit and hopefully.

particular, often take the stand that they have no control over the amount of work coming to them at any one time, and that limitation of machine hours and blanket curtailment plans work a serious hardship upon them. They hold that they should be in a position to handle peak work when it arrives. Consequently, it is not possible to offer a verdict on the effects of curtailment which might be representative of the industry as a whole.

Nevertheless, many finishers—even though disapproving of production curtailment from a theoretical standpoint—admit that the emergency conditions through which we have been passing have necessitated emergency measures if demoralization were to be avoided.

Here is a comment made to us the first of this month which, we feel, reflects the opinion of quite a number:

"While it is a bit too early to predict the full effects of the code for the coming year, nevertheless I have a very strong feeling that the curtailment program brought about by administrative order for the printing industry in the months of January and February will tend to spread printing throughout the entire industry so that, instead of the printing season running into April, we will find it prolonged into May and June. The curtailment program has already had the effect of strengthening the finishing prices. This is particularly true in the rayon end of our industry."

For the future, one of the most important needs confronting this industry is the early development of fair trade practice provisions which will permit finishers to guard against competitive abuses which weaken the price structure and make profitable operation an impossibility.

Rayon and Silk Dyeing and Printing

The second major code—that for the rayon and silk dyeing and printing industry as represented by the Institute of Dyers and Printers—covers, broadly, the "dyeing, finishing, bleaching, mercerizing, weighting, printing, or other processing of rayon, silk, or any mixture of the same, or of any mixture of goods containing primarily silk or rayon, either in the piece or in the yarn," but it excepts "concerns (1) engaged in the weaving of cotton and/or rayon and whose operations are required to be under the cotton textile code, or (2) primarily equipped for, and primarily engaged in, finishing cotton woven fabrics who may also be engaged in finishing rayon and/or other synthetic fiber fabrics."

The straightening out of the lines of jurisdiction of the cotton textile code and this later code was one of the most difficult jobs thrown upon the NRA by the textile industry. Its ultimate solution was particularly fortunate, because the industry covered by this code needs the beneficial effects of intelligent self-government.

Fortunately, it has secured in Major General William N. Haskell a man who undoubtedly will be able to supply just that. His appointment brought the following comment from Division Administrator A. D. Whiteside:

"As executive director of the authority which will administer the code of fair practices for some 130 important textile manufacturing plants, General Haskell will have the opportunity to render a great service to the rayon and silk dyeing and printing industry, to the thousands of persons who are employed in that industry and to the country generally."

One of the most important parts of this industry's codes is the open-price plan provided for. The plan is summarized in the code as follows: "To require each concern to file with the Institute a list of the prices thereafter to be quoted for each of the several services rendered by it. Concerns shall not quote or make prices other than those filed within 10 days after filing with the Institute a modified list of prices. Any quotation of prices in violation of the provisions hereof shall be deemed a violation of this code unless the Code Authority or the price committee thereof shall in advance have approved such quotations. As, when, and if any firm shall file a modified list of prices, any other concern may file for itself a new list of prices to become effective simultaneously with the modified list first filed."

One of the many constructive possibilities of this code is the aid it promises in the suppression of design piracy. A clause states that "no concern engaged in the printing of any fabrics in this industry shall prepare, engrave, or print, or submit to an engraver or printer for engraving or printing, any pattern or design which shall not previously have been registered in the United States Patent Office or in any other office or bureau approved by the Board of Trustees."

Closer Coordination Probable in Cotton Finishing

BY ALBERT L. SCOTT
President, National Association of Finishers of Textile Fabrics

DURING 1934 the effect of the NRA on the cotton textile finishing industry will be to link the general problems relating to the finishing of cotton textiles to the policies of the industry as a whole, since the finishing industry is operating under Code No. 1, the code for the cotton industry.

This means that the finishing industry will, under the code, relate its programs of production and sales closer to the program of the entire industry with the result that there should be better relations between the supply of goods and demand with consequent stabilization of employment and market conditions.

Textile Processing Industry

The third code, that for the textile processing industry as represented by the National Textile Processors Guild, was approved too recently to permit any definite estimation of its results. It became effective Feb. 5.

It gives cohesion to a very important branch of the industry—the commission processing of raw stock, tops, and yarns—and promises to be most helpful.

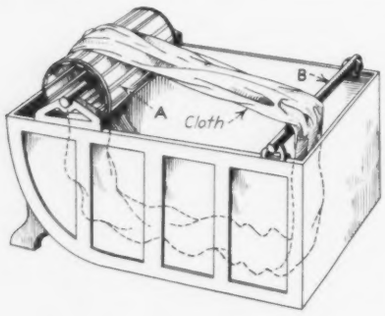
In this case, too, the problem of jurisdiction was most difficult. To guard against future misunderstandings, both this code and that of the rayon and silk dyeing and printing industry authorize the respective Code Authorities to designate representatives to act on a joint committee with representatives of any other Code Authority of a related industry to consider questions of common concern, including the matter of jurisdiction, and to take appropriate action.

In conclusion, it should be stated that the dyeing and finishing industry as a whole was beginning to experience the real results of NRA codes at the beginning of this year, and that the outlook for effective utilization of these instruments is bright.

• PROCESSING KINKS •

Wrinkles in Wool Goods

Despite the common belief of long standing that all wrinkle troubles are directly or indirectly traceable to the scouring or fulling operations, instances can be quoted



to prove that this belief is ill-founded. About a year ago a New England Mill experienced consistent trouble in finishing a 30-oz. piece-dyed overcoating fabric. In accordance with the usual belief, the difficulty was attributed to the finishing operations. However, it finally was found that the trouble was not due either to the scouring or fulling process, but was caused during the dyeing operation. While a piece was in process of dyeing in the regular dyeing machine, it was noticed that the tension and drag on the piece between the reel *A* and the small roller *B* (see sketch) was so excessive that a too large percentage of water was lost between these two points. The theoretical deduction from these facts was that the cloth while in the semi-dry state, retained some of the creases formed while passing over the reel. By removing the small roller *B*, we overcame this defect. R. A.

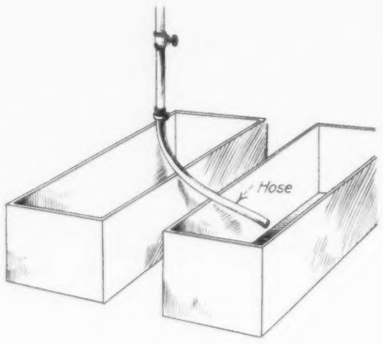
Dyeing Hosiery With Tight Seams

We were having considerable trouble with some service-weight hosiery with heavily reinforced cotton heels. When the hosiery was boarded and the seam stretched out, the cotton in the seam could be seen grinning through, being several shades lighter in color. On hosiery where the seam had not been sewn too tightly the dye would go on evenly; but a large proportion of the goods was thrown out as imperfect. It seemed impossible to get the seamers to sew up the seams with an equal tension on all the hosiery.

Prolonging the boiling of the goods in the bath had but slight effect on the darkening of the cotton in the tight seam. Increasing the amount of penetrant did not materially improve the situation. The dyer finally got over the difficulty by doubling the amount of Turkey red oil used, adding 1% of sodium phosphate to the bath, and entering the glauber salt needed in two portions. The machine was filled with water to just below the shafts holding the drum, the water heated to 120° F., 2% of Turkey red oil added, the properly dissolved dyestuffs entered, the steam turned on, and the goods worked while the bath was slowly brought to the boil. After a 10-min. boil, the phosphate was added and boiling continued for 15 min. At this time one-third of the needed glauber salt was added, and 15 min. later the rest of the salt was entered and the steam shut off. This procedure caused the dyestuffs to be absorbed very slowly, gave good penetration in the tightest parts; and no more hosiery with grinning, undyed seams were seen. Noel D. White.

Dye Tub Improvement

The accompanying sketch shows a new method of serving two dye tubs with a single water-supply line. In place of the usual loose elbow fitting, permitting the water pipe to be turned from one tub to an adjacent one, a flexible water hose is substituted. The hose may be used to feed two or more tubs which are within its reach, and in addition, may be used to direct streams of water into the corners of each tub to remove any accumulations



of dirt, lint, etc. When the hose is not in use, it may be attached to any convenient support to prevent dirt from entering its open end. Wm. R. Clendinning.

Cold Water Scouring of Wool Goods

Within the last year some of the largest woolen and worsted finishers have adopted a process for scouring their fancies and piece dyes using only cold water in the rinsing. This process effects large economies in soap, as well as the saving in steam used to heat the rinse water. A typical formula for this process is as follows: For eight pieces of 15-oz. worsted, each piece measuring 80 to 85 yd. in length, use a soap liquor made up of 1¼ oz. low-titre soap, 2 oz. of soda ash, and 1 oz. of compound F to 1 gal. of water. Compound F is made as follows: 50 parts of 50% sulphonated castor oil, 50 parts of glucose, and 5 parts of sodium hexameta phosphate soluble in water.

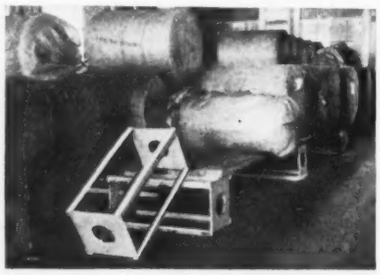
The procedure of cold water scouring is to run in the wet cloth after crabbing, add 100 gal. of the soap liquor, run the goods for 20 min. in the soap liquor, and rinse in cold water for 2 hr. The washers are rigged with two special pot eyes—the first a block of wood with a 2-in. round hole in the center; and the second, a 3-in. triangle cut in the center of a block of wood. The cloth is threaded single in the first pot eye and two pieces in the eye of the second pot eye. The cost of chemicals used in the process is less than a quarter of a cent a yard. Karl R. Moore.

Union Dyeing Without Union Colors

In a job dyehouse we naturally have a great variety of materials to handle and cannot depend on recipes from former lots to help us, as almost every lot is a new problem. In dyeing unions, whether wool and cotton or silk and cotton, or perhaps rayon, there always comes a time when the lot is within a hair's breadth of a perfect match. While we are drying the swatch, however, some more color boils off the cotton or rayon and makes the shade on the wool or silk too heavy. As a result, the goods have to be stripped and redyed. This doesn't happen any more, for we have selected a line of direct colors that will not dye silk or wool in a neutral bath at a boil, together with a line of dyes that dye silk and wool but do not stain cotton or rayon under the same conditions. By using these dyes, we can go ahead at a full boil and build up the shade on each fiber separately, without any fear of the color boiling off onto the other fiber. This method has proven successful on men's and women's wear, hosiery, and ribbons, and particularly on pile fabrics.

Device for Storing Fabrics

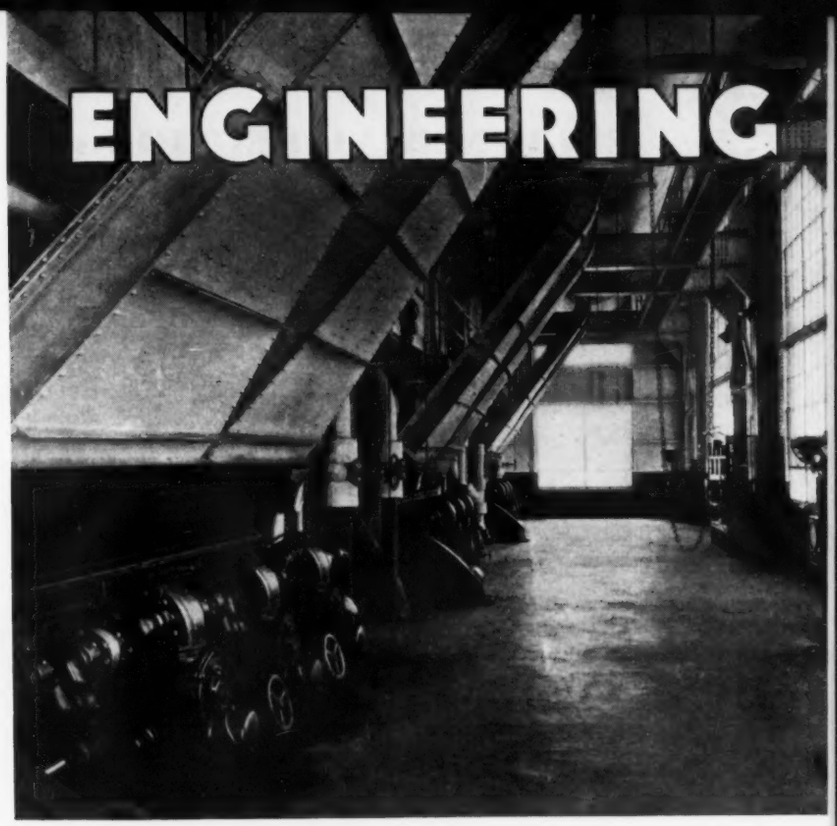
We have used for some time a device which keeps goods, rolls, or cases off the floor, and at truck platform level. This device is flexible in arrangement and is valuable in preventing contact with floor dirt and damage from water due to opened



sprinklers. As shown in the accompanying illustration, the device consists of four-sided supports made of commercial light angles welded to plate-steel heads into a unit structure. This is used with wooden platform tops made of 1½-in. planks fastened to cleats. There is a cleat at each end half the width of the openings in the supports; and two cleats spaced evenly between the ends that are twice as wide as the two end cleats.

This arrangement permits two platform ends to be locked together and supported by a single block, making long platforms, easy to assemble or remove. When the cleats are in the openings of the supports, the frames are locked but can be moved about and rearranged by lifting the platform top far enough to free the cleats from the openings. When knocked down, a large number of platforms not in use can be stored in a small space.

William H. Adams.



Coal-Coke Fuel . . .

TRY-OUT OF NEW MIXTURE OUTSTANDING DEVELOPMENT IN PLANT ENGINEERING

INTRODUCED early last summer, coal-coke fuel received its first try-out in a number of power plants in New England. Use of this new fuel, which is a mixture of semi-bituminous nut and slack and petroleum coke breeze, has met with mingled success and failure. While difficulties encountered with the coal-coke mixture have caused some engineers temporarily to discontinue its use, the fuel has several advantages over straight coal. Further studies will be made, without doubt, to determine the proper methods for burning the mixture, and these investigations may lead to its widespread adoption. Before we consider the other developments in power plant and mill engineering which have taken place during the last year, we shall, therefore, consider in some detail the properties of this new fuel and the problems which have arisen in connection with its use.

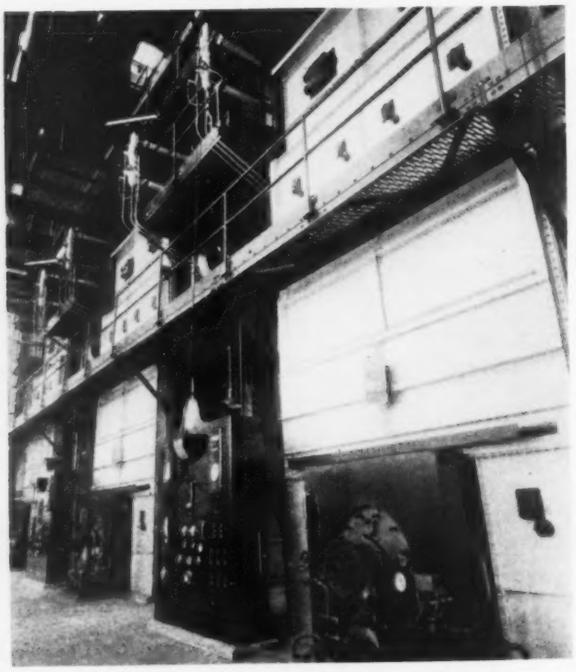
Petroleum coke is the residue left in the cracking stills of the oil refineries and the "breeze" is the "fines" from the process of preparing sized coke for domestic purposes. Mixtures in the ratios of 1-1, 2-1, and 3-1 of coal to coke have been tried. Several factors are involved in the burning of this fuel, the principal one being the amount of ash in the coke component. There are several grades of coke breeze on the market, with an ash content ranging from 0.6 to 2.8% and the volatile matter ranging from 10 to 16%. The low volatile is accompanied by low ash. Coke-breeze ash has a fusion temperature of around 2340° F., while a good New River Nut and Slack will average 2660°. The tendency of the coke as its percentage is increased is to bring the ash fusion temperature of the mixture down to its own level, the greater the amount of ash in the coke, the more power it has to lower this temperature. Thus with a 0.6% ash coke, a 1-1 mixture might cause no trouble; on the other hand, with a 2.8% ash coke, the difficulty with heavy slag clinker might be marked. This slag clinker blanks the tuyeres and the side-wall air holes; and when cooling on the walls of the furnace, seems to pull the bricks out of their setting. The higher-ash coke breeze, while it may perhaps be safely burned in a pulverized-coal furnace, is hardly suited for stoker operation.

Another difficulty encountered in some cases, even with the low-ash coke, was the burning of the grates and the side walls from the intense heat produced at times. The reason for this is not fully understood, and study is now being made to determine the cause. One theory is that the mixture in the overhead bunkers is not uniform, the coke being segregated in spots. Carrying this idea still further, some engineers have suggested that a uniform mixture does not pass from the bunker down into the stoker hopper, the coke coming down and the coal remaining in the bunker. It has been noted that at times there appears to be much more coke in the stoker hopper than one would expect from the percentage of the original mixture.

Among the advantages of the coal-coke mixture are the following: The fuel has a high heat value (15250 B.t.u. in a 1-1 mixture); it supplies a cleaner fire than does all coal over a day's run by reason of less ash (3.5% in a 1-1 mixture); it permits a lower wind-box pressure for the same load due to less ash in the fuel bed; and it is usually obtainable at a slightly lower cost than is all coal. More extended use of the new fuel is dependent on the solution of the problems cited above.

Power Plant Modernization

While the year 1933 has not been marked by any particularly radical developments in equipment for use in textile mill power plants, it has seen an appreciable amount of revamping and modernization of such plants. More and more everything possible is being done to lower the production costs of steam and power. We find, therefore an increasing number of plants that have installed extraction turbines (in some instances double-extraction turbines), with which the greater part of the process steam supplied to the mill is first used for power generation. At the same time, in the research laboratories of the major electric and boiler manufacturing companies new ideas have been originated, new equip-



New boiler plant put in operation in 1933 by Forstmann Woolen Co., Passaic, N. J.

ment has been designed, and new processes have been developed—all contributing to the improvement of existing installations and to the perfection of new ones.

Steam pressures of 1,200 lb. and steam temperatures of 1,000° are being utilized to the end of obtaining a kilowatt at better than 12,000 B.t.u. With an adequate demand for bled steam for process work this figure can be reduced to 4,500 B.t.u. One possible aid to the attainment of these low values may be in the use of the enforced circulation system in the boiler, and this possibility is being carefully studied.

Fabrication of boiler drums by welding has eliminated the riveted joint and has greatly lessened the danger of caustic embrittlement. The latest development in drum fabrication is to form the head from the cylindrical portion by drawing and hot-spinning. This method in turn eliminates the welded joint at the head.

Photo-Electric Cell

The photo-electric cell, which has found numerous applications in many industries, has at last made its appearance in the boiler room. One use is to control the draft fan and the oil-feed valve on oil-burning furnaces. The cell is inserted in the boiler setting, but sufficiently removed from the heat to prevent damage therefrom. As long as the light from the burning oil reaches the cell, the control circuits are closed; if the fire be extinguished from any cause, the cell opens the circuits, thus closing the oil feed valve and shutting down the draft fan. This prevents any possibility of explosion from premature re-ignition of the oil vapors in the furnace. A second application is to control the feed water level. With a light on one side of the gage glass and the cell on the other, the direction of the beam of light will be altered so as to strike the cell just so long as the water in the glass is at the predetermined level. When the water falls below this level, the beam of light fails to reach the cell, a relay operates and opens the feed valve, or sounds an alarm, or both. The photo-electric cell can also be used to give an alarm when the smoke density in a flue or stack reaches a certain point.

Intensive study has been made with a view to improving steam turbine operation, lessening the losses, and raising the efficiencies. A figure for the latter of 95% has been considered as not being impossible. Effort is being made to reduce the leakage between stages and to lower the so-called leaving loss between the last wheel and the condenser. Better and more reliable speed control has been developed in double-extraction turbines by improvement in the governing mechanism. During the last year several costly fires have occurred, caused by the ignition of the turbine oil in the governing and lubrication system from contact with pipes carrying highly superheated steam. To avoid this possibility, special attention is being given in new installations to separating the oil and steam piping systems so that contact cannot take place. There has been produced a synthetic non-inflammable liquid which can be used for the governor-actuating fluid, and it is hoped that eventually a similar compound can be found with proper lubricating qualities for use as a turbine oil, thus eliminating all possibilities of fire.

Maintenance of Blading

Proper maintenance of the blading is a matter that has been of much concern to all users of steam turbines. The two principal troubles have been erosion and deposits, both ending to decrease operating efficiencies, while the former introduces the hazard of the blading loosening and doing material damage. Wet steam is the prime cause of erosion and is most common in the low-pressure stages. The greatest success in preventing this erosion has been in equipping the back of the inlet edge of the bucket with Stellite shields. Such a blade made of 12% chromium steel has an erosion-resistance factor of 6.3, as compared with a factor of 1 for the unprotected blade.

Deposits on turbine blading—or scaling, as it is often called—is another source of expense to the power plant management, as removal of the deposit is ordinarily expensive and laborious. Boiler waters in which the impurities are precipitated in the form of sludge within the boiler are the worst offenders. These substances in the steam are reduced to a fine dust after passing through the superheater and are in the most favorable form to deposit on the blading. The soluble deposits can be removed by injecting water into the steam before it enters the turbine, but this operation must be done with extreme care so as not to injure the blades. Thus far hand scraping has been the only satisfactory method of removing the insoluble deposits, and this means a considerable outage for the unit. The best solution of the problem is to work at its source, the boiler, and to reduce to the minimum any carry-over in the steam.

Of considerable interest to power plant engineers are a series of tests dealing with the exact nature of the condensation process in a surface condenser, and being carried on in a power station by two professors of the Massachusetts Institute of Technology. It is known that in the usual condenser the steam condenses as a fine mist on the tubes, much as a mist forms on a cold mirror. The film serves to insulate the tubes to a certain

extent and thus retards the passage of heat from the uncondensed steam to the condensing water. This lowers the rate of condensation and increases the size of the condenser necessary for a stated capacity. It was found that if the outside of the tubes was coated with soap, the steam condensed in droplets instead of mist and the rate of condensation was more rapid. It was discovered also that it was the oleic acid content of the soap which caused this action and that the acid alone was similarly effective; also that the acid was not easily washed off by the condensate. The importance of this discovery is that it may enable the use of smaller condensers for given capacities. There are two points which should be further investigated. Oleic acid is a weak organic acid and attacks certain metals to some extent. Would such action take place on the tubes, and would the tubes be weakened thereby to a serious extent? Would any of the oleic acid be present in the condensate? If the condensate were used again for boiler water, any oleic acid present might cause foaming or priming. In addition, the possibility of corrosion taking place within the boiler should be studied.

Power Transmission

Leaving the power plant and entering the mill, we find an increasing use of the geared motor, which has been refined and made available in a wider range of sizes. This type of motor is particularly applicable for individually driven textile finishing machines where the low speed required has, in the past, been an obstacle to the use of the individual drive. Ball-bearing motors have been developed and have found favor for use in driving spinning and twisting frames. The over-all length of a motor thus equipped is less than that of the motor with the usual type of bearing; and therefore the motors can be used in alleys between frames which would not permit the use of the regular type of motor. Another improvement in motors is a thermostatic device which will open the circuit of a motor when the temperature of the windings approaches the danger point. This device is mounted on the windings, and in some instances will again close the circuit when the temperature becomes normal.

Mill Lighting

We find that the proper lighting of mills is being given more attention from the viewpoints of both health and efficiency. Improved instruments for instantly determining the intensity of illumination at any point greatly facilitate the study of the lighting conditions in a mill. Perhaps the most novel improvement in lighting equipment from a health standpoint is that adopted in a number of silk and hosiery mills in which mercury-vapor lamps are fitted with a special glass that permits the passage of a limited amount of ultra-violet rays. This amount is stated to be about one-twentieth of that emitted by the sun-bath lamp; and therefore the operative can work under it all day without being overexposed.

In a previous section of this article reference was made to the development of a non-inflammable liquid to replace oil in the governing mechanism of steam turbines. Likewise there has been produced a non-inflammable synthetic fluid to replace the oil commonly used in transformers and capacitors. This fluid has a high dielectric factor. By its use, the size of transformers for a given load can be materially reduced and all fire hazards are eliminated.

Metal coating is being given much attention. Metal wire fed through a circle of oxyacetylene flames is changed to the molten state, and then by means of compressed air is reduced to a fine spray for coating purposes. In this way, copper, stainless steel, lead, tin, and other metals can be deposited in a uniform layer of any desired thickness to serve as a lining for size tanks, steel tanks for any liquids, dye kettles, soap and starch mixers, and for the resurfacing of dry cans. The same process can be used for the building up of worn calender rolls and for coating equipment used in connection with corrosive liquors.

Roof maintenance in textile buildings has always been costly, both wet and dry rot being common in such buildings. Thoroughly impregnated lumber is helpful in overcoming decay and is now being widely used. Insulation of roofs is another aid, as it prevents condensation of the moisture in the room air on the wood.

Other developments of the year include more extended use of heat exchangers for recovering the waste heat in spent dye and wash liquors, and the increasing popularity of V-belt drives, which have recently been made available with sheaves of pressed steel instead of cast iron.

In the last few years funds have been lacking for the full utilization of the numerous refinements made in power and engineering equipment. With a return to normal business conditions hoped for in 1934, we predict that mill executives will be alert to avail themselves of the benefits of these power-saving and cost-reducing improvements.

Textile Mill Construction

TEXTILE mill construction reported in 1933 aggregated approximately $6,330,000. There were comparatively few large projects, and plant expansions accounted for a large percentage of the total volume. The capital outlay for construction in various branches of the industry is summarized as follows:

Cotton Mills	$2,256,000
Rayon (Yarn and Weaving)	1,850,000
Knitting Mills	745,500
Processing Plants	718,000
Woolen and Worsted Mills	518,000
Silk Mills	244,000
Total	$6,331,500

The following table reprinted from our February issue shows that North Carolina, with $1,446,000, and Tennessee, with $925,000, led the other States in new construction for the year.

North Carolina	$1,446,000
Tennessee	925,000
South Carolina	916,500
Georgia	794,000
Virginia	386,000
Rhode Island	332,000
Pennsylvania	288,000
New Jersey	235,000
Alabama	234,000
Other States	775,000
Total	$6,331,500

Machinery Sales

INCREASED IN 1933, RETURNING ALMOST TO 1931 LEVEL

◆ *Through the cooperation of manufacturers of textile equipment and accessories,* TEXTILE WORLD *is enabled to bring up to date its figures on machinery sales to the industry. This study now covers the five-year period, 1929-33 inclusive.*

THE progressive slump in textile machinery sales since 1929 was arrested in 1933, a sharp increase being registered over 1932. Confidential information secured from manufacturers discloses the following outstanding trends:

1. Dollar volume of sales in 1933 was 44% *above* the 1932 volume.
2. The 1932 volume, in turn, was 32% *below* 1931 and set an abysmally low record, being 61% below 1929.
3. The 1933 volume returned very nearly to the 1931 level, but was still 44% below 1929.

Using 1929, the year in which this compilation was started, as the base, 100, the following index numbers show the trend for the last five years:

1929	100
1930	67
1931	57
1932	39
1933	56

It must be emphasized that this is a *trend* study only. The above figures cannot be offered as positive data. Manufacturers were asked to submit percentage comparisons instead of figures revealing actual sales. Such comparisons, when averaged, show trends but not assuredly accurate indices.

Nor can the figures be offered as indicative of conditions within any one company. Certain wide variations were revealed. For example, one company's sales in 1932 were only 20% of its 1929 volume—and remained at that level in 1933, while another company was as much above the average as this one was below. However, a surprisingly large number occupied a middle ground, within a reasonable radius of the averages quoted above. Consequently the table can be offered as reflecting trends with reasonable accuracy.

As an outside check, it is interesting to note that, at the hearings on the textile machinery code in Washington last summer, figures were produced indicating that 1931 sales of a representative group were 56% of the 1929 volume. By reference to the above table, it will be seen that our estimate places 1931 at 57% of 1929.

Incidentally, in September, 1932, we predicted that textile machinery sales that year would be well below 1931 but that 1933 should about reach the 1931 level. Both these predictions are borne out above. We mention this, partly in order to gloat over what may have been just a happy guess, but also to instill in the reader a certain amount of confidence in the reasonable accuracy of this study.

We mentioned above that there was disparity among firms. There was also disparity among groups. For example, while dollar volume of 1933 machinery sales for the industry as a whole was 44% above 1932, manufacturers of preparatory, spinning and weaving equipment registered a 75% gain; makers of bleaching, dyeing and finishing equipment a 30% gain; knitting machinery manufacturers less than a 10% gain; and makers of accessories a 40% gain.

Outlook for 1934

So much for the past. Opinions on the future seem to be colored by the individual's attitude toward the New Deal. One man says: "Dare not venture any opinion as to 1934 outlook with the present crazy outfit in Washington." But here is what another man expects of the "crazy outfit": "I do feel that with governmental activities in the way of stimulating circulation of money, coupled with the lowering of the dollar value, we should unquestionably sometime during the year definitely head upward and away from the years of depression in which we have been working for a longer time than we care to think about."

There is a preponderance of optimism in the opinions received. In fact 70% of those heard from predicted decided improvement in machinery sales in 1934; 20% were just as decidedly pessimistic, while 10% sat on the fence. The general attitude is one of far greater encouragement than we have encountered in this same group for some time.

Effect of Codes

Naturally, the principal point at issue seems to be the effect of the codes. Here are a few comments on this point:

✦ Since it is apparent that in spite of all of the advantages that industry has within its reach when cooperating with the NRA, competition is not to be eliminated, but in many cases will be greater than ever, the distribution of productive machinery particularly relating to style appears to be more logically one for restricted and planned distribution. The illogic of unplanned production and distribution has been so clearly indicated in the last three years that it is entirely possible that the lessons learned will bring about new methods of distribution by the more important manufacturers.

✦ We have two very large prospects in sight at the present time, and I should say that the outlook in machinery sales will be very good unless we run into code restrictions that will prohibit our customers from putting in new machinery.

✦ We believe that in spite of the clause in the textile manufacturers' code (or maybe I should say because of it) there will be more new machinery sold in 1934 than there was in 1933, and we

believe that this clause will practically force every mill that has not kept itself in efficient condition to replace its antiquated equipment with modern machinery, not only because of the increased production made possible by so doing, but because of the increased quality that it is possible to obtain. We therefore, look forward to quite a lot of replacement work, and also a lot of machinery required in new developments in rayon and rayon-and-cotton combinations that are inevitable.

✦ In regard to the outlook for 1934, while at present it is not very encouraging, we confidently expect there will be considerable replacement business during the second half of the year. Much depends, however, upon what restrictions or regulations are placed upon mill operations. It is quite certain that there is a tremendous amount of new equipment required and as soon as the mills can get onto a profitable basis many new orders will be forthcoming.

✦ The clauses contained in various textile codes, especially the cotton textile code, forbidding the purchase of productive machinery are having a very serious effect on our business as they are preventing enlargements by up-and-coming firms and presumably prevent new enterprises. The writer has talked with several active and influential textile people and finds that while many of them believe that these clauses may be necessary for a temporary arrangement, the sooner they are modified or abandoned the better. Undoubtedly the "weak sisters" are carried along by companies that should be allowed to expand as their requirements and opportunities dictate; and if allowed for any length of time, they encourage monopoly for those that are already engaged in the business. We of course are very much opposed to these clauses, but can see no chance of any immediate relief. For anyone to assume that companies manufacturing textile machinery can obtain enough replacement orders to be reasonably busy for any length of time is certainly a fallacy.

Probable Volume of Sales

Predictions for the future varied from very definite statements of sales expectations to extremely uncertain hopes or fears. Here are a few:

✦ I feel that if expenditures for capital goods, particularly heavy equipment, go 50% higher in dollar volume than in 1933, all of us shall have no cause for complaint. Personally, I do not believe that the increase will exceed 50%, and possibly it will not reach it.

✦ The outlook for 1934 is decidedly better than at any time since 1929. We are reasonably confident, barring catastrophic developments in the general business situation, that our volume for 1934 will exceed that of 1933.

✦ Our prospects for the year 1934 in the textile machinery field do not seem very encouraging. We have less unfilled business on hand at present than for several years past, and fewer prospects. We will be very well satisfied should we equal in 1934 the same amount of sales as 1933.

✦ I can only advise that the business which we are getting from the textile field is holding up fairly well, and we believe we will receive considerably more business from the textile industry during 1934—possibly double what we did in 1933.

✦ We are not at all dismayed by the outlook for 1934, and feel confident that it should show an improvement over the year just finished.

✦ It is very dangerous to hazard a guess as to what the future holds for textile machinery sales for 1934, but it is the writer's own personal opinion that things will continue about on their present level unless some unusual and outside force, such as another war, interferes. We ourselves are quite optimistic but find many of the mill men who are quite the reverse.

✦ If we may judge by what has been happening during the last few months, we believe 1934 will be a much better year for us. We have had a number of good inquiries in our line of late; in fact, January has started off very well indeed.

✦ The outlook for the current year is rather obscured, and it is almost impossible to make a definite statement as to what we expect in the way of machine orders. However, as long as severe curtailment of production is continued we cannot reasonably expect any substantial quantities of new business in our field.

✦ For 1934, we are extremely optimistic and expect to see still further increase in the sales volume for this period.

Need for Replacement

Here are a few further thoughts on the outlook for replacement purchases:

✦For the last four years there has been comparatively little purchasing of new textile machinery. Due to previous prosperous years, there was, when we entered this depression, ample machinery to carry through the last four years. Due to failures and liquidations much used machinery, the greater part of it worthless, has been thrown on the market. As we see it, this has been pretty well absorbed. Hard-pressed for capital and credit, machinery that in more normal times would be replaced, will be patched up, and its service continued. This augments the demand for new machinery, which demand has been accumulating. Ultimately the demand for new machines should be tremendous . . . That much new equipment is needed to manufacture efficiently, there is no doubt. That many will carry on with their old equipment seems probable. Conceding that there is a demand or need of much new equipment, that many would not hesitate to make the required commitment, the question of financing the purchases appears to be a long way from being solved. We are optimistic, look for better business than last year, but must admit we do not, as yet, see signs of recovery approaching anything like normal during the present year.

✦ Looking forward to 1934, the prospects are good, if there is any consistent improvement in business. At the present time the feeling with most mill people is that they will not put any equipment in, except that which is absolutely necessary to take care of equipment that is impossible to use or to provide equipment necessary to make a product which is saleable on today's market. There has, of course, been a considerable amount of replacement of parts on idle machinery, as these had been robbed to keep other equipment going. If we except this latter business, general purchasing of equipment is practically at a standstill at present and will probably remain so until the Administration proposes some financial program which will have the confidence of manufacturers generally.

"Alibi for Lack of Guts"

As an epilogue, we append the following:

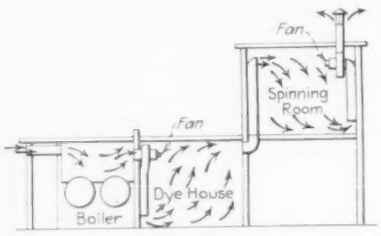
✦ I must come back to one fact: that the volume of sales which any machinery company will do in 1934 depends not so much upon conditions, as upon individual effort. I feel that too many sales managers and salesmen are using depressed conditions as an alibi for lack of guts. Sales will come in proportion to the skill of the salesman for a given company and the alertness of its selling department.

✦ Textile manufacturers and buyers of textile machinery and supplies have abandoned the policy of buying on price only. Cheap, inferior, low-priced equipment and supplies have proven extravagant and expensive at any price. The result of this change in buying policy has encouraged manufacturers of textile machinery and supplies to exert every effort possible to produce better products, more efficient products, and products that are infinitely cheaper in the end to the consumer than products purchased on price only . . . Quality! Quality! Results! Results! These words seem to be the slogan of the intelligent buyer of textile equipment today. First cost is entirely incidental. With production limited by hours of operations, every mill man knows he must reduce stoppage of machinery to a minimum. Every time an inferior quality supply has to be adjusted or replaced the mill treasurer loses profits, because production of yarn or cloth is reduced. This situation opens up constructive possibilities for selling textile equipment and supplies on the basis of assured performance.

• ENGINEERING KINKS •

Equalizing Air Conditions

If often happens in certain types of textile mills that the air in some rooms is too hot, in others too moist, and in still others too dry. These conditions interfere not only with the comfort and health of the operatives, but with the processes carried on. It is sometimes possible to improve conditions of this kind at a comparatively small expense, as illustrated by



the following case which came to the writer's attention.

The rooms in question were an overheated boiler room, a wet and foggy dyehouse, and a spinning room too dry for satisfactory work. The method employed for partially equalizing heat and moisture and improving air conditions in all three rooms is shown diagrammatically. While the dyehouse and spinning room were some distance apart, the duct leading to the latter was not particularly expensive or sufficiently long to interfere with the effectiveness of the scheme. The arrangement, as indicated by the drawing, was to close in the space above the boilers, and blow air through this into the dyehouse. This air is discharged near the floor, and the temperature of the room is regulated by means of a supplementary heater and by-pass damper.

Moist air from the upper part of the dyehouse is drawn into the spinning room by means of an exhaust fan taking air from the opposite side through a number of openings near the floor. While the locations of the different departments in this plant were particularly well adapted to an arrangement of this kind, the idea should prove of value in other mills.

Polishing Chrome-Nickel Steel

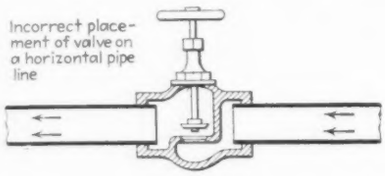
Chrome-nickel steel, the so-called 18-8 metal, is being widely used for dye kettle bodies, and in fact, for the complete kettle. During fabrication of the machine various parts of the metal may be subjected to heat; for example, in rolling the sheet, in drawing of the rods, or in welding. To prevent corrosion all parts which have been heated should be ground or polished. Polishing or grinding removes a film which has been formed during heating; and results thus far indicate that removal of the film prevents subsequent corrosion of the metal.

Weave Room Paint

In our weave room we carry a very high humidity, and we have been bothered some with mildew or fungus growth forming on the ceiling. We have tried many different kinds of paint, but thus far we have found only one thing that will prevent this trouble. We use plain unslaked lime and make a heavy whitewash with it. This we apply right over the regular mill white paint. This seems to cut down the fungus growth to a minimum. The humid atmosphere prevailing in the room prevents the whitewash from scaling, and therefore it stays on the wall and ceiling. The mixture must be thick enough to give a uniform white all over when applied with a 6-in. brush. When applied properly, it cannot be told from regular mill white paint, although it has no gloss. It is easy to apply and holds its color of pure white even longer than other paints that we have used.

Drainage of Piping Systems

Every engineer is familiar with the necessity for proper drainage of all piping systems, whether for power or heating. Water hammer is not only annoying, but dangerous, particularly when it occurs in pipes carrying high-pressure steam. For this reason, care must be taken to eliminate all pockets where condensation can collect. This trouble is as likely to be found in new work as in old plants, because gate



valves are generally used in high-pressure installations at the present time.

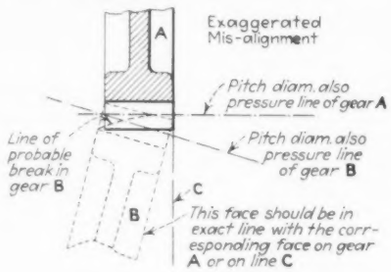
If globe valves are used in horizontal lines, the stem should be placed in a horizontal position, *not* with the stem in the vertical position shown in the sketch. In this connection we might add that gate valves should not be placed in horizontal pipes with the stem vertical and the wheel at the bottom. Otherwise, if they are only partly opened, an obstruction to drainage will be formed similar to that formed by the globe valve.

Cross-Circulation in Boilers

When analyzing samples of boiler water taken from each drum or each blow-off connection of two-drum water-tube boilers used in connection with controlled feedwater treatment, power-plant engineers frequently find widely different results as regards alkalinity, sulphate, and phosphate ratios, and color. It has been discovered that much of this variation is due to the lack of proper circulation from one drum to the other. Installation of cross circulating tubes causes this variation to disappear, and samples of water taken from all parts of the boiler show practically the same values. These tubes, two in number, pass the water from a header formerly connected to one drum to the other drum, and thus a cross circulation is set up.

Preventing Gear Breakage

An ordinary cast-iron gear with properly cut teeth should run for years without breaking or excess wear, provided that it is properly oiled in the bearing holes and that it is meshed correctly with its teeth parallel with the teeth of the gear with which it runs. Wear, of course, will occur in the bearing; but wear can be reduced


A
Exaggerated Mis-alignment
Pitch diam. also pressure line of gear A
Line of probable break in gear B
Pitch diam. also pressure line of gear B
C
B
This face should be in exact line with the corresponding face on gear A or on line C

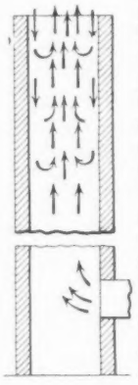
by providing a ground or otherwise perfectly round stud and a reamed hole in the gear with running fit as specified in the various handbooks.

If the stud bracket or swing arms that carry change gears are not fastened onto a milled surface, or the brackets not square themselves, it is more than probable that the teeth of the two meshing gears meet at a slight angle. This throws all the driving pressure on the outer end of the tooth in such a manner that a little extra shock will shear the tooth off with very little effort as shown in the sketch. A check on these points will do much toward preventing breakage of gears.

P. S. Huntley.

Improving Chimney Draft

A new boiler plant was fired up for an initial trial, and the draft was found to be so weak that only a small portion of the required load could be carried. A new chimney had been built, and there seemed to be no reason why the expected results should not be realized. As the difficulty continued, I was called in consultation. A careful check-up between plans and installation failed to show any discrepancy, and I decided to go over some of the principal computations, starting with the chimney.



The height was found to be correct, but the flue was approximately double the area required, and oblong in shape — the length being twice the width. Upon investigation, I learned that the owners expected to add another unit of equal size at some future time, and the chimney had been designed with this in view. I reasoned that the movements of the air currents within the flue were something like those shown in the accompanying diagram, and suggested a cast-iron chimney cap with an opening only one-half that of the flue area. This suggestion was carried out, and no further difficulty was experienced.